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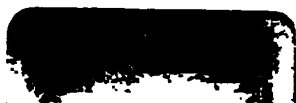
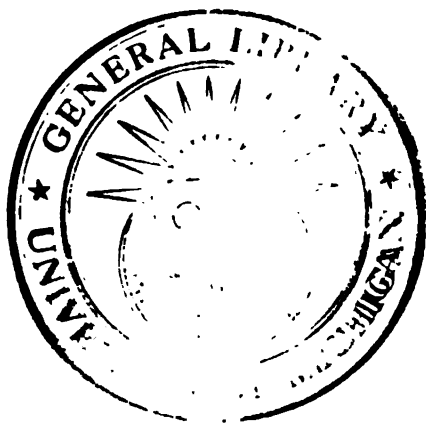
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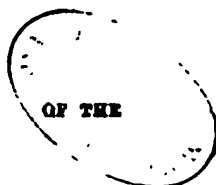
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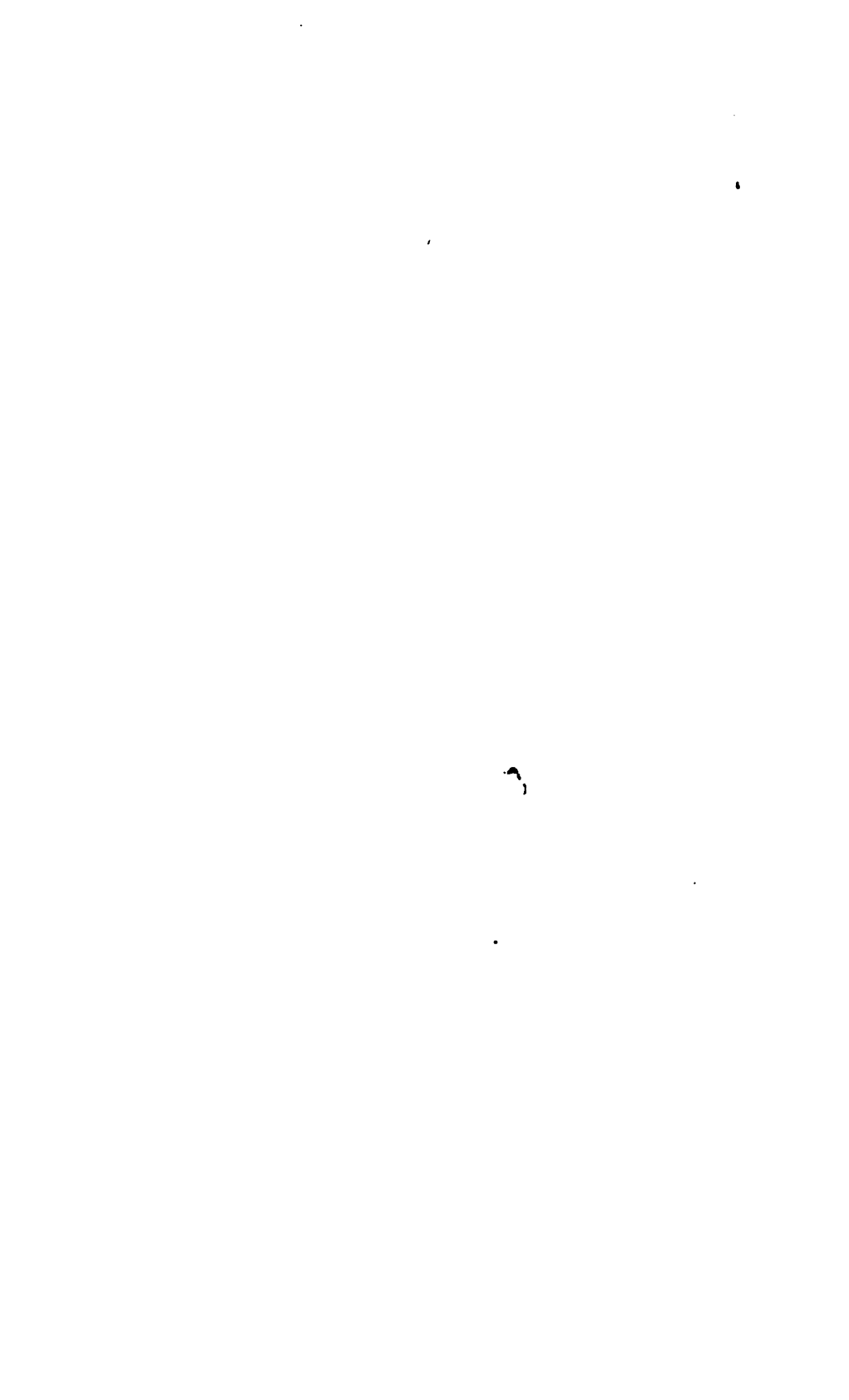
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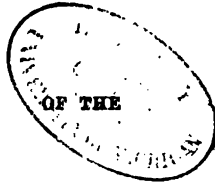
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761

INDEX TO VOLUME VIII.

- Ashread, S., remarks on presenting alga, 79; don. to mus., i. v. vi. ix. xviii. xix. xxviii.
- Ashmead, Sam. B., death of, 257.
- Academy, Imperial, of Science, don. to lib., xii.
- Academy Roy. Imp. Meteorol. and Mag., don. to lib., xii.
- American Acad. Arts and Sci., don. to lib. xvii.
- Agnew, W. G. E., don. to mus., xxviii.
- Academy of Sciences of Lyons, &c., don. to lib., xxx.
- Blake, W. P., elected cor., 59; don. to lib., iii.
- Billings, Mr., specimen, remarks on, by Dr. Leidy, 62.
- Boston Society of Nat. Hist., don. to lib. iii.
- Bigler, Hon. W., don. to lib., vi.
- Bridges, R., M. D., Vice President, verbal com. on iron ore, 102; don. to mus., xiv.
- Bead, F., don. to mus., xix.
- Brown, Prof., don. to lib., xv. xxxiii.
- Bailey, Prof., 79.
- Barton, Dr. T. R., don. to mus., i.
- Burt, J. L., M. D., U. S. N., don. to mus., iv.
- Barnet, G. J., don. to mus. v.
- Berke, W. G., don. to mus., v.
- British Museum, 161.
- Benney, W. G., 214, don. to mus. xxviii.
- Brazier, A. J., don. to lib., xv.
- Baker, Dr., don. to mus., xviii.
- Baker, R. B., don. to mus., xix.
- Bowers, Mr., don. to mus., xx.
- Brown, Dr., don. to lib., xx.
- Berkeley, M. J., don. to lib., xxiii. xxiv.
- Berkeley and Broome, don. to lib., xxiii.
- Berkeley & Welwitsch, don. to lib., xxiv.
- Berkeley & Curtis, don. to lib., xxiv.
- Berkeley & Desmazières, don. to lib., xxiv.
- Babbage, C., don. to lib., xxvi.
- Bailey, Rev. Mr., don. to mus., xxvii.
- Committees on Scientific papers: on "enumeration of mosses," by T. P. James, 1; on *Ambystoma*, by E. Hallowell, M. D., 1; on two new *Ichthyodorulites*, by Jos. Leidy, M. D., 4, 5; a new synopsis of the *Mycetophagids* of the U. S., by J. L. LeConte, M. D., 5; synopsis of the *Phalacridæ* of U. S., ib., 5; notice of *Scarabidæ* in United States, ib., 5; table of species of *Chlœnius* in United States, ib., 5; on synopsis of species of *Chrysomela* and allied genera in U. S., by W. F. Rogers, 5; on notes on N. American birds in A. N. S., by John Cassin, 5; on synopsis of *Entozoa*, &c., by J. Leidy, M. D., 5; on notice of remains of extinct mammalia from Nebraska, by the same, 5; description of remains of fishes from Carboniferous and Devonian formations of U. S., by J. Leidy, M. D., 61; descriptions of some remains of fossil mammalia, ib., 61; on new species of *Gasteropoda* from Nebraska, by Messrs. Meek & Hayden, 62; on a fossil genus of the fam. *Blastoidea*, by Messrs. Shumard and Yandell, 62; remains of extinct reptiles and fishes, discovered by Dr. Hayden on Judith river, by J. Leidy, M. D., 62; on three extinct fishes, ib., 76; on the sandstone fossils of the Connecticut river, by J. Deane, M. D., 76; new

- fresh water shells of California, by I. Lea, 76; a new species of *Triquetra*, ib., 76; a new genus of *Naiades*, ib., 76; notice of remains of extinct mammalia, discovered by Dr. Hayden in Nebraska, by J. Leidy, M. D., 76; a new snake from Illinois, R. Kennicott, 77; thirty new species of fossil *Acephala* and *Gasteropoda* from Nebraska, by Messrs. Meek & Hayden, 77; on fossil remains of a Seal from Ottawa river, U. C., by J. Leidy, M. D., 77; on several new genera and species of fossil fishes of carboniferous strata, Ohio, by J. S. Newberry, M. D., 78; *Plantæ Kaneanæ Arcticæ et Polaris*, by E. Durand, 101; on new articulate, by A. Sager, 102; on four new exotic *Uniones*, by I. Lea, 102; thirteen species exotic *Peristomata*, ib., 104; on *Synopsis Fungorum* in America, by Messrs. Berkeley & Curtis, 104; on new species fossil *Acephala* and *Gasteropoda* from Nebraska, by Messrs. Meek & Hayden, 105; contributions to the Ichthyology of west coast U. S., by C. Girard, M. D., 105; on *Ceratites*, by Prof. L. Harper, 105; examination of meteoric iron from Xiquipilco, by W. J. Taylor, 105; two new *Urodelæ* from Georgia, by E. Hallowell, M. D., 105; new gen. and sp. *Urodela* of U. S. Exploring Expedition, by C. Girard, M. D., 139; fifteen new species exotic *Melaniana*, by I. Lea, 139; new sp. *Hyla*, by J. L. LeConte, M. D., 140; notes on new reptiles in A. N. S., by E. Hallowell, M. D., 141; on new sp. African birds in A. N. S., from P. DuChaillu, by J. Cassin, 144; on remains of extinct *Vertebrata*, by J. Leidy, M. D., 161; on *Cyprinoid* fishes of fresh waters west of Mississippi, &c., by C. Girard, M. D., 162; on the *Byssus* in genus *Unio*, by I. Lea, 163; *Synopsis* of the *Melolonthidæ*, by J. L. LeConte, M. D., 215; on genus *Salmo* in California, by C. Girard, M. D., 215; extinct *vertebrata* of N. Jersey from Prof. Cook, by J. Leidy, M. D., 215; new species of birds in Nat. Mus. and in Mus. A. N. S., by J. Cassin, 216; on reptiles in A. N. S., by E. Hallowell, M. D., 216; on Dr. Hammond's reptiles from Kansas and Nebraska, ib., 216; on extinct *Vertebrata* discovered by Prof. E. Emmons, by J. Leidy, 216; on extinct fishes discovered by J. E. Evans, M. D., ib., 216; on new species *Tanager*, by Mr. Sclater, 259; eleven new sp. *Uniones* from Georgia, by I. Lea, 259; existing *Mollusca* in Little Lakes, by J. Lewis, M. D., 259; on a new bird of genus *Campylorhynchus* of Spix, by P. L. Sclater, 260; birds of Southern Indiana, by R. Haymond, 260; notice of remains of two sp. Seal, by J. Leidy, M. D., 260; new fossil *Mollusca* of Nebraska, with a catalogue, by Messrs. Meek & Hayden, 260; new and remarkable genus *Ranidæ* from river Parana, by E. Hallowell, M. D., 261; remarks on extinct sp. fishes, by J. Leidy, M. D., 299; classification of the vegetable kingdom, by T. G. Hilgard, M. D., 300; on extinct turtles of N. Jersey, by J. Leidy, M. D., 300; on Dr. Heermann's collection of Texan reptiles, by E. Hallowell, M. D., 301; on extinct *Vertebrata* discovered by F. V. Hayden, by J. Leidy, M. D., 301; catalogue of birds collected by Mr. DuChaillu at Cape Lopez, by J. Cassin, 301; description of three new genera and twenty-three new sp. of tertiary fossils from California and one from Texas, by T. A. Conrad, 301.
- Committees: on letters of Dr. Lewis, 259; on letters of Prof. Oldham and of T. Biddle, Jr., 260.
- Committees, election of standing, 3.
- Clanton, S. W., M. D., don. to mus., xix. xxvi.
- Curtis & Berkeley, don. to lib., xxiv.
- Coates, B. H., M. D., don. to lib., xviii.
- Canadian Institute, don. to lib., xvii.
- Cassin, John; notes on N. American birds in collection of A. N. S. and Nat. Mus., 39; resolutions by, 76, 77, 143; descriptions of new sp. African birds in mus. A. N. S., collected by Mr. P. B. DuChaillu in Equatorial Africa, 156; descriptions and notes on birds in col. A. N. S. and in Nat. Mus., 253; letter from Mr. DuChaillu, 300; catalogue of birds collected at Cape Lopez, W. Africa, by Mr. P. B. DuChaillu, in 1856, &c., 316.
- Camac, W., M. D., don. to mus., iv.
- Corse, Dr., don. to mus., ix.
- Carson, J., M. D., 139, 261; don. to mus., ix.
- Coppedge, O. D., don. to mus., xxvii.
- Chandler, W. P., don. to mus., xxviii.

Coleman, W., don. to mus., x.
 Cope, Alfred, 141.
 Cresson, C. M., don. to mus., xiv.
 Coppée, Prof. H., 327.
 Coles, E., don. to lib., xvi.
 Cabanis, Dr., don. to lib., xvi.
 Correspondents elected :
 Rauch, John H., M. D., 4.
 Steiner, Lewis H., 1.
 Green, J. W., M. D., 4.
 Blake, W. P., 59.
 Hayden, F. V., M. D., 75.
 Von Müller, Baron J. W., 141.
 Davis, J. Barnard, 159.
 Schlater, Philip Lutley, 296.
 Elliott, Right Rev. Stephen, 296.
 Conrad, T. A., descriptions of three new genera; twenty-three new sp. of middle tertiary fossils from California and one from Texas, 312.
 Deane, James, M.D., on the Sandstone Fossils of the Connecticut river, 76; don. to lib., xi.
 Drinker, Sandwith, Esq., 76, 299; don. to mus., ix.
 Deck, Dr., don. to mus., v.
 Dana, J. D., Prof., don. to lib., vii. xvi. xxi.
 Durand, Mr., 101.
 Davis, Jos. Barnard, 216.
 Davidson, Geo. B., don. to mus., xiv. xix. xx.
 Draper, E., don. to mus., xiv.
 Dickinson, W. E., don. to mus., xiv.
 Dunlap, T., 327.
 De Vesey, L., 327.
 Damazieres & Berkeley, don. to lib., xxiv.
 Denay, W. H., don. to lib., xxiii.
 Dewey, H. B., don. to mus., xxviii.
 Election,—Standing Committees, 3; of members and correspondents, 4, 59, 75, 138, 141, 159, 214, 257, 296, 327; annual of officers, &c., 326; of librarians, 159.
 Editors Am. Journ. Sci. and Arts, don. to lib., iii. vi. xi. xv. xx. xxx.
 Editors Charleston Med. Journ. and Rev., don. to lib., iii. vii. xi. xv. xx. xxx.
 Editors N. O. Med. and Surg. Journ., don. to lib., viii. xii. xx. xxiii.
 Editors N. Y. Med. Times, iii. viii. xii. xv. xvii. xx.
 Editor Canadian Nat. and Geologist, don. to lib., xi. xvi. xxiii.

Edwards, Milne, don. to lib., xiii.
 Editors of Louisville Review, xvi.
 Editors Peninsular Journ. Med., don. to lib., xvii.
 Elwyn, A. L., M.D., resolution by, 75.
 Eckert, J. R. & F. S., execrs. of J. Read, 104.
 Eckert, Mrs. M., don. to mus., ix.
 Elliott, Rt. Rev. Stephen, 296.
 Editors of Canadian Journal, don. to lib., xxiii. xxxiii. xxxv.
 Earle, G. W., don. to mus., xxvi. xxvii.
 Engelman, don. to lib., xxx.
 Essex Institute, don. to lib., xxx.
 Fisher, J. C., M.D., don. to mus., ix. xviii.
 Frazer, J. F., don. to mus., ix.
 Foltz, Dr., U. S. N., don. to mus., x.
 Forbes, W. S., 214.
 Francfort, Eugene, M. D., 257.
 Frauenfeld, George, don. to lib., xiii.
 Fisher, C., don. to mus., xx.
 Foulke, W. P., don. to mus., xxvi.
 Farrady and Reiss, don. to lib., xxx.
 Guillou, C., don. to mus., i. xiv. xix.
 Gilliams, don. to mus., i.
 Gilman, Lieut., J. M., U. S. N., don. to lib., ii. 922
 Girard, Chas., M. D., contributions to the Ichthyology of the W. coast of the U.S., from specimens in the Mus. Smith. Inst., 131; on a new genus and species of Urodela, from the collections of U. S. Expl. Exped., &c., 140; researches upon the Cyprinoid fishes inhabiting the fresh waters of the United States of A., west of the Mississippi valley, &c., &c., 165; notice upon the species of the genus Salmo of Authors, observed chiefly in Oregon and California, 216.
 Gilpin, Chas., don. to mus., xix.
 Garrigues, S. S., M. D., 138; don. to mus., xxvi.
 Gobrecht, W. H., M. D., 141.
 Griffith, R. E., M. D., 257.
 Genth, F. A., M. D., don. to lib., xiii; don. to mus., xviii.
 Gross, Prof. S. D., 327.
 Gray, Asa, don. to lib., xxiii.
 Gleizes, J. A., don. to lib., xxvi.
 Gould, Dr. A. A., don. to lib., xxx.
 Haymond, Rufus, M.D., Birds of south eastern Indiana, 286.

- Hilgard, T. C., M.D., 301; synopsis of a new classification of the vegetable kingdom, 304.
- Hartman, W. D., M. D., don. to mus., xviii.
- Hayes, I. I., M. D., don. to mus., xx. xxvii.
- Holbrook, Prof. J., don. to mus., xix.
- Hesse, F. G., 298.
- Hoopes, B. A., elected cor., 59; don. to mus., iv. v. xiv.
- Hayden, F. V., M. D., see F. B. Meek and F. V. Hayden, 63, 70, 72, 75, 77, 81, 109, 265.
- Hamilton, F. H., don. to lib., xv.
- Hammond, Dr., U. S. A., don. to mus., xix. xxvii.
- Hill, W. A., don. to mus., ix.
- Hill, A. C., don. to mus., ix. x.
- Hallowell, E. M. D., description of several species of Urodela, with remarks on the distribution of the Caducibranchiate division, and their classification, 6; description of two new species of Urodèles from Georgia, 130; notes on the reptiles in mus. A. N. S., 144; on several new species of reptiles in A. N. S., 153; notes on the reptiles in A. N. S., 221; notice of a collection of reptiles from Kansas and Nebraska, presented to A. N. S. by Dr. Hammond, U. S. A., 225; on a new and remarkable genus of Ranidae, from the river Parana, 298; notice of Dr. Heermann's collection of reptiles from near San Antonio, Texas, 308; description of a new genus of Colubriiform serpents, from California: don. to mus., iv. ix. xiv.; remarks on Urodeles, 101.
- Harper, Prof. L., on *Ceratites Americanus*, 126.
- Hooker, Sir W., per A. Gray, don. to mus., i.
- Hanson, W. C., don. to mus., i.
- Hazlehurst, S., per J. A. Clay, don. to mus., i.
- Horner, J. G., don. to mus., iv.
- Hart, C. P., M. D., don. to mus., v.
- Hopkins, Prof. W., don. to lib., viii.
- Harlan, R., Jr., don. to mus., xxvi.
- Heermann, Dr., don. to mus., xxvii.
- Howell, S. B., don. to mus., xxvi.
- Institute Roy. Imp. of Geology, don. to lib., xii.
- See Society.
- Jardin des plantes Paris, exch. with mus., v.
- Jackson, C. T., exch. with lib., vii.
- Jeanes, Jos., don. to mus., ix.
- Jordan, A., don. to lib., xxx.
- Kennicott, R., Esq., description of a new snake from Illinois, 77, 95; don. to lib., viii.; don. to mus., ix.
- Kennedy, R. W., don. to mus., i.
- Krider, John, don. to mus., v. xiv.
- Kane, Dr., don. to mus., ix. x.
- Keller, William, M. D., don. to mus., ix.
- Kittoe, E. D., M. D., don. to mus., xiv.
- Kane and Mitchell, don. to mus., xiv.
- King, A., M. D., don. to mus., xviii.
- Kite, T., don. to mus., xix.
- Kuhn, C., don. to mus., xx.
- Kennedy, Dr. H. W., don. to mus., xxvi.
- Kirtland, Dr. J. P., don. to mus., xxviii.
- Knieskern, P. D., xxvii.
- Les, Isaac, Vice Pres.; description of new fossil fresh water shells, of California; description of a new species of *Triquetra*, Klein; description of a new genus of *Naiades*, 76; description of twenty-five new species of *Exotic Uniones*, 77, 92; remarks on a tooth of a *Sauroid* reptile, from near Phoenixville, 77; description of a new sub-genus of *Naiades*, 79; description of new fresh water Shells, from California, 80; description of thirteen new species of *Exotic Peristomata*, 109; description of twenty-five new species of *Exotic Uniones*, 92; description of four new species of *Exotic Uniones*, 103; description of fifteen new species of *Exotic Melaniana*, 144; description of the *Byssus* in the genus *Unio*, 213; exhibits specimens of *Uniones* with *Byssus*, 215; description of eleven new species of *Exotic Uniones*, from Georgia, 262; com. on *Triquetra lanceolata*?—now named *Contorta*, 300; don. to mus., v; don. to lib., xiii.
- Ledy, Joseph, M. D., exhibits heart of a dog containing worms, 2; paper on two new *Ichthyodorulites*, 4; paper on entozoa, &c., 5; description of two *Ichthyodorulites*, 11; a synopsis of Entozoa and some of their Ecto-congeners, observed by the Author, 42; notices of some remains of extinct Mammalia, recently discovered by Dr. F. V. Hayden in the Bad Lands of Nebraska, 59; remarks on a specimen from Mr. Billings, 62; notice of remains of extinct Reptiles and Fishes,

- discovered by Dr. F. V. Hayden in the Bad Lands of Judith river, Nebraska Territory, 72; notices of three extinct Fishes, 76; notices of remains of extinct Mammalia, discovered by F. V. Hayden, in Nebraska Territory, 76; notices of the remains of a species of seal, from the Post-pliocene deposit of the Ottawa river, U. C., 77, 90; notices of several genera of extinct Mammalia, previously less perfectly characterized, 77, 91; notices of extinct Mammalia, discovered by Dr. F. V. Hayden, in Nebraska Territory, 98; notice of some remains of extinct vertebrated animals, by Joseph Leidy, M. D., 163; notices of remains of extinct vertebrated animals of New Jersey, collected by Prof. Cook, of the State Geo. Survey, under Dr. W. Kittchell, 220; notices of remains of extinct vertebrated animals, discovered by Prof. E. Emmons, 255; notice of some remains of Fishes, discovered by Dr. J. E. Evans, 256; notice of remains of two species of seals, 265; remarks on certain extinct species of Fishes, 301; notices of remains of extinct Turtles of New Jersey, collected by Prof. Cook, &c., under Dr. W. Kittchell, 303; notices of extinct Vertebrata, discovered by Dr. F. V. Hayden, during the Expedition to the Sioux country, &c., 311; don. to mus., ix. xiv. xix.
- Library Co., of Phila., don. to lib., xi.
- Latour, M. Huguet, don. to lib., ii. xxxv. xxxvi.
- Leahey, Chas., 299.
- Lang, E., M. D., death of, 261.
- Lewis, J., M. D., on living Mollusca in Little Lakes, 259.
- Lecombe, Dr. A., don. to mus., xiv.
- Lobeck, Dr. J. F., don. to lib., xiii.
- Lepsius, Dr. R., don. to lib., xi.
- Lewis, S., M. D., don. to mus., v. xix.
- Lacondaire, M. Th., don. to lib., vii.
- Lamborn, R. H., don. to mus., i. iv.
- Lyceum Nat. Hist., N. Y., don. to lib., vii.
- Lawson, Genl. T., M. D., don. to lib., viii.
- Lawson, the Misses, privilege to endorse tickets
- Le Conte, J. L., M. D., papers by, referred to Com., 5; synopsis of the Mycetophagids of the U. S., 11; synopsis of the Phalaenids of the U. States, 15; note on the genus *Lithodus*, of Schonherr, 18; notices of three genera of Scarabæids found in the U. S., 19; analytical table of the species *Chlœnius* found in the U. S., 25; don. to lib., vii.; don. to mus., x. xiv. xviii. xix.
- Le Conte, Major John, don. to mus., i. xiv.; description of a new species of *Hyla*, from Georgia, 146.
- Lea, Joseph, don. to mus., xxvii.
- Logan, Dr., don. to mus., xxvii.
- Lowe, E. J., don. to lib., xxxiii.
- Letters:—
- American Antiquarian Soc., 1. 61, 77.
- Lyceum of Natural History, Fort Des Moines, i.
- Linnæan Soc. of London, 4.
- Am. Philosoph. Soc. 4, 162.
- Smithsonian Institution 4, 5, 77, 162.
- Boston Soc. Nat. Hist. 5, 161.
- Lyceum Nat. Hist. N. Y., 5, 76.
- Imperial Soc. of Naturalists of Moscow, 76, 164, 139.
- Trustees of N. York State Library 76.
- University of Wurtzburg, 76.
- Phila. Annual Conference of M. Episcopal Church, 76.
- Roy. Lib. of University of Göttingen, 77.
- Univ. Lib. of Heidelberg, 77.
- Univ. of Jena, 77.
- Nat. Hist. Soc. of Danzig, 77.
- Wurtemberg Nat. Hist. Soc., 77.
- Imperial Geological Inst. of Vienna, 104, 299.
- Seuckenberg Nat. Hist. Soc., 104.
- Soc. for Advance. of Horticulture, Berlin, 104.
- Roy. Acad. Sci., Amsterdam, 104.
- K. L. C. Acad. Sci., Breslau, 104.
- Roy. Bavarian Acad. Sci., 104.
- Acad. Sci., St. Louis, 104, 161.
- Soc. for succor of drowned persons, Amsterdam, 139.
- Zoologische Botanischen Verein, of Vienna, 139, 299.
- Canadian Institute, 161.
- British Museum, 161.
- Roy. Soc. Liege, 161.
- Nat. Hist. Union of Prussian, Rhineland and Westphalia, 161.
- Roy. Acad. Sci., Madrid, 162.
- Roy. Bar. Acad., Lib. Dept. 215.
- Royal Society of Sciences at Upsal, 215, 299.
- Roy. Acad. Sci. Naples, 215.
- Prot. Episc. Gen. Convention, 216.

- Trustees Australian Museum, 216.
 Sec. of State of United States, 216.
 Imp. Soc. Sci. and Belles-Lettres
 Lyons, 259.
 Linnæan Soc. of Lyons, 259.
 Imp. Soc. Agriculture and Nat. Hist.
 Lyons, 259.
 Imp. Acad. Sciences, Vienna, 299.
 Dublin University Zoolog. and Botan.
 Association, 300.
 Soc. Arts, Manufactures and Com-
 merce, London, 301.
 Letters from individuals:—
 Steiner, Lewis H., 1.
 Hayes, I. I., 4.
 Wood, W. W., 4.
 Wilson, Dr. Joseph, 4.
 Ashmead, Saml., 4.
 Billings, E., 61, 101.
 Drinker, S., 61.
 Tuckerman, E., 61, 101.
 Gibbs, George, 61, 105.
 Sauvage, A., 62, 161.
 Blake, W. P., 62.
 Rauch, T. H., 76.
 Peters, T. M., 76.
 Meek, F. B., 101.
 Sager, Abm., 102.
 Frauenfeld, Geo., 104.
 Koch, Prof. Karl, 104.
 Eckert, J. R. & F. S. Execu., 104.
 Burlag, R. C., 139.
 Kane, E. K., M. D., 139.
 Bronn, H. G., 139.
 Barr, M., 140.
 Hayden, F. V., 161.
 Shumard, B. F., 161.
 Binney, W. G., 215.
 Kennedy, W. H., 215.
 Davis, J. B., 216.
 Oldham, Mr., 260.
 Lewis, Dr. J., 259.
 Biddle, Thos., Jr., 260.
 Bowman, Capt. A. W., 261.
 Schlater, P. L., 299.
 Hammond, W. A., M. D., 299.
 Ede, E. J., 299.
 McChesney, Dr., 299.
 Kirtland, J. P., 300.
 DuChailu, P. B., 300.
 Members elected:—
 Uhler, Wm. M., M. D., 4.
 Wilson, Joseph, M. D., U. S. N. 4.
 Hayes, Isaac I., M. D., 4.
 Blackwood, Wm., M. D., 4.
 Jeanes, Samuel, 4.
 Gibbs, George, 4.
 Caldwell, J. E., 75.
 Cresson, Chas. M., M. D., 75.
 Brasier, A. J., 75.
 Hoopes, B. A., 59.
 Baker, C. S., M. D., 138.
 McAllister, John, Jr., 138.
 Garrigues, S. S., M. D., 138.
 Cope, Alfred, 141.
 Gobrecht, Dr. W. H., 141.
 Mayberry, Wm., M. D., 159.
 Morton, Thos. G., 159.
 Morehouse, G. R., 159.
 Binney, W. G., 214.
 Forbes, W. S., 214.
 Weightman, Wm., 214.
 Wilson, Ellwood, M. D., 257.
 Griffith, R. E., M. D., 257.
 Francfort, Eugene, M. D., 257.
 Hesse, F. G., 298.
 Zeigler, Geo. J., M. D., 298.
 Packard, J. H., 298.
 Coppée, Prof. H., 327.
 De Vesey, Louis, 327.
 Gross, Prof. S. D., 327.
 Smith, A. H., M. D., 327.
 Dunlap, Thos., 327.
 Mohl, H., don. to lib., xxiii.
 Montague, C., M. D., don. to lib., xxiv.
 Meek, F. B. and F. V. Hayden, M. D.:
 descriptions of new species of Gas-
 teropoda from the Cretaceous forma-
 tions of Nebraska Territory, 63; des-
 criptions of new species of Gastero-
 poda and Cephalopoda from the Cre-
 taceous formation of Nebraska Terri-
 tory, 70; descriptions of thirty new
 species of Acephala and Gasteropoda
 from the Cretaceous formations of
 Nebraska Territory, 77, 81; descrip-
 tions of Acephala and Gasteropoda
 from the Tertiary formations of Ne-
 braska Territory, &c., &c., 111; des-
 criptions of new fossil species of
 Mollusca, collected by Dr. F. V.
 Hayden in Nebraska Territory, to-
 gether with a complete catalogue,
 &c., &c., 265.
 Mettenheimer, A. C., don. to lib., xvi.
 Managers and Treas. Maryland Inst.,
 don. to lib., xv.
 Meek, F. B., don. to lib., vii.
 Martin, Dr., U. S. N., don. to mus.,
 xiv.
 Mitchell, S. W., M. D., don. to lib.,
 xvii.; don. to mus., xiv. xix.
 Miles, Dr., don. to mus., xx. xxvii.
 McAllister, John, Jr., 138.
 Morris, Dr., on A. St. Martin, 138.
 McClellan, J. H. B., M. D., don. to
 mus., ix.; don. to lib., xxxi.
 McClellan, Capt., don. to mus., ix.
 Meigs, C. D. Dr., don. to mus., x.

Mercantile Lib. Assoc., N. York, don. to lib., xiii.
 Mitchell, S. W., don. to mus., xiv.
 McChesney, Dr., 299; don. to mus. xvii.
 Morris, Dr. C., 301.
 McCandles, J., don. to mus.; xvii.

Newberry, J. S., M.D., description of several new genera and species of fossil Fishes from the Carboniferous strata of Ohio, 78, 96.

Notaris, Professor G. de, don. to lib., xxiii.

Navy Department of U. S., don. to lib., xii.

Nott, Dr. J., don. to mus., xx. xvii.

Newcomb, Dr. W., don. to mus. xvii.

Oldham, Prof., letter, 260.

Pell, Duncan E., don. to mus., i.

Publication Com., don. to lib., iii.

Patent Office, don. to lib., xxv.

Peters, T. M., don. to mus., v.

Phillips, J. S., don. to mus., x, xix.

Packard, J. H., 298.

Potts, J. G., don. to mus., xix.

Pierce J., don. to mus., xx.

Philadelphia Lib. Co., don. to lib., xi.

Report of Committee on paper of T. P. James, 1; on Dr. Hallowell's paper, 5; on Dr. Leidy's papers, description of some remains of Fishes from the Carboniferous and Devonian formations of the U.S., and description of some remains of extinct Mammalia, 62; on papers of Drs. Meek and Hayden; on Dr. Leidy's and on Drs. Shumard and Yandell's papers, 62; on Mr. Lea's papers, on Dr. Leidy's paper, on Mr. Kennicott's, on Messrs. Meek and Hayden's, on Dr. Leidy's, on Mr. Lea's, on Dr. Newberry's, 79; on Mr. Durand's paper, 103; on Mr. Lea's paper, 103; on Messrs. Berkeley and Curtis' paper, 108; on Mr. Sager's paper, 108; on Mr. Lea's, 108; on Messrs. Meek and Hayden's 108; on Mr. Taylor's, 108; on Dr. Hallowell's, 108; on Mr. Girard's, contributions to the Ichthyology of W. coast of U. S., 139; on Dr. Girard's paper, 140; on Mr. Lea's paper,

on Major Le Conte's, on Dr. Hallowell's, and on Mr. Cassin's, 144; on Dr. Leidy's paper, on Dr. Girard's paper, on Mr. Lea's paper, 163; on Dr. Le Conte's paper, 216; on Drs. Girard and Leidy's, 216; on Mr. Cassin's, 216; on Dr. Hallowell's, 216. on Dr. Leidy's, 216; on Messrs. Selater's, Haymond's, Leidy's, Meek and Hayden's, and Hallowell's, 261; on Dr. Leidy's, Mr. Hilgard's, Drs. Hallowell's, Leidy's, and Messrs. Cassin and Conrad's papers, 301.

Regents of N. Y. University, don. to lib., xxiii.

Ruschenberger, W. S. W., M. D., don. to mus., ix. x. xix.

Roy. Acad. Sci., Munich, don. to mus., xv.

Report of Treasurer, 326.

Report of Mr. Ord from Com. on Wilson Monument fund, 138.

Report of Mr. Cassin from Com. on list of Correspondents, 138.

Report of Corresponding Sec., for Dec. and Jan., 2, 322; for Feb. and March, 75; 138.

Report, Annual, of Recording Sec., 2, 322.

Report of Curators for 1856, 325.

Report of Com. to revise list of members, by Dr. Le Conte, 214.

Report, Special, of Com. on Proceedings, 322.

Report of Librarian for 1856, 325.

Report of Publication Committee, 326.

Resolutions: Mr. Haldeman's resolution in favor of the Misses Lawson, 4; Dr. Elwyn, 75; Mr. Cassin's, as to Mr. Drinker, 76; as to Mr. Wood, 77; Dr. Leidy's in favor of St. Louis Acad. Sci., 103; *ibid*, as to State Med. Soc., 103.

Rand, T. D. H., don. to mus., xix.

Rogers, W. F., paper by, 5; synopsis of species of Chrysomela and allied genera, inhabiting the U. S., 29; don. to mus., iv.

Richards, F. De B., don. to mus., iv.

Reed, Jas., *Execrs. of*, 104.

Rand, Dr., 143, 257, 261; don. to mus., xviii.

Rush, J. M., U. S. N., 143.

Retzius, Prof. A., don. to lib., xxiii.

Sedgwick, Prof., don. to lib., iii. xi.

State of New Jersey, don. to lib., xv.

Smith, A. H., 143, 327; don. to mus., i. xix.; don. to lib., viii. xxxi.

- Smith, Capt. H. J., don. to mus. i.
 Society Nat. Hist. of Prussian Rhine-
 land and Westphalia, don. to lib., xx.
 Society, Roy., of Sciences, Munich,
 don. to lib., xx.
 Society, Imp., of Naturalists, of Mos-
 cow, don. to lib., xiii.
 Society, Boston, of Nat. Hist., don. to
 lib., iii. vii. xi. xvii. xx. xxiii. xxx.
 Society, Elliott, of Charleston, S. C.,
 don. to lib., xii.
 Society of Arts, London, don. to lib.,
 iii. xii. xxvi. xxx.
 Society of Entomology, Stettin, don. to
 lib., xv.
 Society, Linnæan, of London, don. to
 lib., iii.
 Society, Zoological, of London, don. to
 lib., iii. xxxv.
 Society, Wurtemberg, Nat. Hist., don.
 to lib., xx.
 Society, Am. Philosophical, don. to
 lib., iii. xvii.
 Society, Am. Antiquarian, don. to lib.,
 viii.
 Society, Hist., of Pa., don. to lib., xi.
 Society, Wurtemberg, Nat., don. to
 lib., xii.
 Society for rescuing the drowned, Am-
 sterdam, don. to lib., xv.
 Society, Royal, of Edinburgh, don. to
 lib., xxx.
 Society, Linnæan, of Lyons, don. to lib.
 xxx.
 Society, Imp., of Agri. of Lyons, don.
 to lib., xxx.
 Society, Nat. Hist., Halle, don. to lib.,
 xxxiii.
 Society, Nat. Hist., of Geneva, don. to
 lib., xxxiii.
 Society, Geol. and Polytec. Yorkshire,
 don. to lib., xxxiii.
 Society, Leeds Philosophical, don. to
 lib., xxxiii.
 Society of Nat. Hist., of Senckenberg,
 don. to lib., xv. xvi.
 Society of Arts, Sci., and Lett., of
 Hainau, don. to lib., xv.
 Society, Imp., of Sci. and Agri., at
 Lille, don. to lib., xxi.
 Society, Imp., of Nat. Sci., of Cher-
 bourg, don. to lib., xxi.
 Society, Roy., of Sciences, of Madrid,
 don. to lib., xxi.
 Society, Roy., of Sciences, of Turin,
 don. to lib., xxi.
 Society, Geological, of Turin, don. to
 lib., xxiii.
 Society, Imperial Academy, of Bor-
 deaux, don. to lib., xxiii.
 Society, Royal, of Sciences, of Liege,
 don. to lib., xx.
 School of Mines, don. to lib., xxx. xxi.
 Sheaffer, P. W., don. to mus., iv. xxvii.
 Steiner, L. H., M. D., 1; don. to lib.,
 xv. xxxv.
 Streng, T. A., don. to mus., iv.
 Sauvalle, F. A., don. to mus., ix. xviii.
 Smith, C. E., don. to mus., v. ix.;
 verbal com., 102. don. to lib., xxxiii.
 Silliman, Prof., exchange with mus., v.
 Sager, A., description of three Myria-
 poda, 109.
 Sandberger, Dr. Fr., don. to lib., xi.
 Safford, Jas. M., don. to lib., xii.
 Sec. of War., don. to lib., xv.
 Schafhirt, F., don. to mus., xviii.
 Special resolutions:—Dr. Leidy's on
 casts, 105; Dr. Le Conte's to Dr.
 Kane, 108; Dr. Rand's, 139; Mr.
 Cassin, on resignation of Dr. Zan-
 zinger as Lib., 143, Mr. Lea's, as
 to Episc. Convention, 215; *ibid*, as
 to U. S. Ag. Soc., 215; Mr. Vaux's
 to publish list of members, &c., 215;
 Le Conte, J. L., M.D., on publica-
 tions, 299.
 Stimpson, W., don. to mus., xx. xxvii.
 Smithsonian Institution, don. to lib.,
 xxiv.
 Shumard, B. F., M.D., and L. P. Yan-
 dell, M.D., notice of a new fossil
 genus of Family Blastoides, from
 Devonian Strata, Kentucky, 73; don.
 to lib., xi.
 Selater, Philip Lutley, M.A., 298; de-
 scription of a new species of Tana-
 ger of the genus *Saltator*, 261; char-
 acters of an apparently undescribed
 bird, belonging to the genus *Campylorhynchus* of Spix, with remarks
 upon other species of the same group,
 263; don. to lib., vii. xxvi. xxxiii.
 Smith, F. G., M. D., don. to lib., xxiii.
 Sally, Alfred, don. to mus., xxvii.
 Trustees N. Y. State Lib., don. to lib.
 viii. xvi.
 Taylor, W. J., examination of the me-
 teoritic iron from Xiquipileo, Mexico.
 128.
 Tuckerman, E., don. to mus., ix.; don.
 to lib., xii.
 Tiffany, S., don. to mus., ix.
 Turner, Dr. T., U. S. N., don. to mus.,
 x.
 Trustees Free Pub. Lib., New Bedford,
 don. to lib., xiii.
 Trask, J. B., M. D., don. to lib.,
 xiii.

- Tappan, H. P., D. D., don. to lib., xvi.
 Tyson, J. R., don. to lib., xvii. xxxv.
 Taomey, Prof., don. to mus., xviii.
 Thomas, K., M. D., don. to lib.,
 xxi.
 Tzoechel, Dr. F. H., don. to lib., xxxv.
- U. S. Com. of Ind. affairs, don. to lib.,
 iii.
 U. S. War Dept., per Col. Abert., don.
 to lib., iii.
 U. S. Patent office, don. to lib., vi.
 U. S. Sec. of Treas., don. to lib., vi.
 U. S. Supt. Coast Survey, don. to lib.,
 vi.
 Uhler, Dr., don. to mus., v. ix. xiv.
 xviii. xix. xx. xxvi. xxvii.
- Vaughan, F., don. to mus., xviii.
 Vaux, W. S., 59; don. to mus., i. xix.
 Verbal Communications :
 Smith, Chas. E., 102.
 Bridges, R., M. D., 102, 104, 143.
 Hallowell, E., M. D., 101, 105, 141.
 Cassin, J., 102, 144, 300.
 Leidy, J., M. D., 102, 104, 139, 140,
 161, 162, 299.
 Smith, A. H., 1, 143.
 Lea, I., 77, 403, 300.
 Morris, Dr., on St. Martin, 138.
 Uhler, Dr., 139, 261.
 Ord, G., 140.
 Rand, Dr., on death of J. M. Rush,
 U. S. N., 143, 257, 261.
 Ashmead, S., 161.
 Carson, J., M. D., 261.
- Vaux, W. S., Pub. Com., 299.
 Lesley, Chas., 299.
 Morris, C., M. D., 301.
 Verein Zoologisch-botanischen in Wein,
 don. to lib., xii.
- Wilson, Dr. T. B., don. to mus., i. vi.
 viii. x. xiv. xx. xxi. xxiv.; don. to
 lib., ii. iii. x. xi. xiii. xv. xvi.
 xvii. xxi. xxx. xxxi. xxxiii. xxxv.
- Wood, W. W., Esq., 76; don. to mus.,
 iv.
- Wilson, W. S., don. to mus., iv.
 Wilson, Edward, don. to lib., xxi. xxiv.
 xviii. xxxii. xxxiv.
- Watson, Dr. G., don. to mus., v. ix.
 Wistar, Mrs. W., don. to mus., v.
 Wilson, Jos., Jr., M. D., U. S. N., don. to
 lib., vi.; don. to mus., xviii. xix.
- Warren, J. C., M. D., don. to lib.,
 viii.
- Weightman, Wm., 214.
 Wilson, Ellwood, M. D., 257.
 Wilson, Capt. Jas., don. to mus. xiv.
 Ward, T., don. to mus., xix.
 Welwitsch & Berkeley, don. to lib.,
 xxiv.
 Wall, W. S., don. to lib., xxvi.
- Yandell, L. P., M. D., and B. F. Shu-
 mard, M. D., 73.
- Zantzinger, Dr. W. S., resignation as
 Librarian, 141.
 Zeigler, Geo. J., M. D., 298.

PROCEEDINGS
OF THE
ACADEMY OF NATURAL SCIENCES
OF PHILADELPHIA.

January 1st, 1856.

Vice President BRIDGES in the Chair.

Letters were read—

From the American Antiquarian Society, dated Worcester, Mass., 28th Dec., 1855, proposing an exchange of Publications.

From the Secretary of the Lyceum of Natural History, of Fort Des Moines, Iowa, also proposing exchanges.

On leave granted, the Committee on a paper by Mr. Thos. P. James, read at last meeting, and entitled "An enumeration of Mosses detected in the Northern United States, which are not comprised in Gray's Manual, a few of which are new species," reported in favor of publication in the No. of Proceedings for Nov. and Dec., 1855.

January 8th.

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A letter was read from Dr. Lewis H. Steiner, dated Baltimore, 7th Jan., 1856, acknowledging the receipt of his notice of election as a *Correspondent*.

Mr. Aubrey H. Smith remarked, in relation to the specimen of native Cinnabar, presented by him this evening, that it was procured by Capt. J. H. Smith, from the mouth of a drift, in the new Almaden Mine, California, at an elevation of two thousand feet above the level of the sea; and is stated by him, to contain 95 per cent. of real Cinnabar, and not to be richer than a great portion of the ordinary product of the mine.

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Dr. Hallowell presented for publication in the Proceedings, a paper entitled "On a new species of *Ambystoma* from Lake Superior." Referred to Dr. Leidy, Col. McCall and Dr. Le Conte.



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Dr. Leidy exhibited the heart of a dog, in which the right auricle, right ventricle, and the pulmonary artery and its branches, were literally stuffed with worms. Minute worms have long been known circulating with the blood, and termed *Hæmatozoa*. About five years since, Dr. L. described in vol. 5 of the Proceedings, the worm exhibited this evening, as *Filaria Canis cordis*. The males measure five inches in length, the females ten inches.

Two hearts were brought to Dr. L. by Mr. Jos. Jones, of Georgia; one, that of a pointer, had in it five worms; the other, that of a cur, was the one exhibited. It is probable that both *venæ cavæ* were also filled, as the portions of those vessels that remained, were blocked up. The animals did not die from the presence of the entozoa, but were killed in the course of some experiments. The cur was emaciated and voracious, restless when awake, and disturbed in its sleep.

January 29th.

Vice President BRIDGES in the Chair.

The Report of the Corresponding Secretary, for Dec., '55 and Jan., '56, was read.

The Recording Secretary read his Annual Report as follows:—

REPORT OF THE RECORDING SECRETARY FOR 1855.

During the year ending 30th November, 1855, there have been elected to the Academy, twenty-three Members and ten Correspondents. One Member has resigned.

There have been no deaths among the Members during that period.

The following papers have been read and ordered to be published in the Proceedings or Journal of the Academy.

By Samuel Ashmead. Catalogue of Marine Algae, from Beesley's Point, New Jersey, with some remarks.

By Spencer F. Baird, two, to wit: Characteristics of some new species of North American Mammalia, collected by the United States and Mexican Boundary Survey, under Major W. H. Emory, U. S. Army, Commissioner, Part I; Characteristics of some new species of North American Mammalia, collected chiefly during the United States Surveys of a Railroad route to the Pacific, Part 1.

By Wm. P. Blake. Notice of remarkable Strata of the Remains of Infusoria and Polythalamia in the Tertiary Formations of Monterey, California.

By John Cassin, four, to wit: A list of Pigeons of the Genus *Carpophaga* Swainson, in the Collection of the Academy of Natural Sciences of Philadelphia, and of the United States Exploring Expedition, Washington, D. C., with descriptions of new and little known species; Notes on the North American Falconidae, with descriptions of new species; Descriptions of new species of Birds from Western Africa, in the Collection of the Academy of Natural Sciences of Philadelphia; Description of a new species of Parrot, *Brotozeris aurifrons*, published in the Journal.

By T. A. Conrad, six, to wit: Observations on the Eocene Deposits of Jackson, Miss., with descriptions of thirty-four new species of Shells and Corals; Descriptions of three new Cretaceous and one Tertiary Bivalve; Description of three new species of Unio; Descriptions of seventeen new Cretaceous and Tertiary Fossils; Descriptions of six new species of Cretaceous Shells from Texas, in the Collection of Major Emory; Description of a new species of Paludina.

By Julian Deby. Remarks on the Cryptogamic Flora of the State of Georgia. Published in the Journal.

By Elias Durand. *Plantæ Prattenianæ Californicæ*; an enumeration of a collection of California Plants, made in the vicinity of Nevada, by Henry Pratten, Esq., of New Harmony, Ind., with critical notices of such as are new or yet unpublished in America. Published in the Journal.

By F. A. Genth, Ph. D., two, to wit: *Herrerite* identical with *Smithsonite*; Analysis of the meteoric Iron from Tucson, Province of Sonora, Mexico.

By Charles Girard, two, to wit: Abstract of a Report to Lieut. James M. Gillis, U. S. Navy, upon the Reptiles collected during the U. S. Naval Astronomical Expedition to Chili; Observations upon the viviparous Fishes inhabiting the Pacific coast of North America, with an enumeration of the species observed.

By T. Charlton Henry, M. D. Notes derived from observations made on the Birds of New Mexico, during the years 1853 and 1854.

By Isaac Lea, L. L. D. Description of a new Mollusk from the Red Sandstone near Pottsville, Pa.

By Major John Le Conte, F. L. S., three, to wit: Description of new species of *Astacus* from Georgia; On a new species of *Gelasimus*; Remarks on two species of American *Cimex*.

By John L. Le Conte, M. D., eight, to wit: Descriptions of the species of *Trox* and *Omorgus* inhabiting the United States; Some corrections in the nomenclature of *Coleoptera* found in the United States; Description of new *Coleoptera* collected by Thomas H. Webb, M. D., in the years 1850, '51 and '52, while Secretary to the United States and Mexican Boundary Commission; Synopsis of *Pyrochroides* of the United States; Synopsis of the *Lathridiides* of the United States; Analytical table of the species of *Hydroporus* found in the United States, with description of new species; Notes on the *Amara* of the United States; Synopsis of the *Hydrophilidae* of the United States.

By Joseph Leidy, M. D., four, to wit: Remarks on the identity of *Bootherium* *cavifrons* with *Ovibos moschatus* or *O. maximus*; Indications of twelve species of Fossil Fishes; Contributions to a knowledge of the Marine Invertebrate Fauna of the coasts of Rhode Island and New Jersey; published in the Journal. Indications of five species with two new genera of extinct Fishes.

By J. Aitken Meigs, M. D. Relation of Atomic Heat to Crystalline Form. Published in the Journal.

By Joseph G. Norwood and Henry Pratten: Notice of Fossils from the Carboniferous Series of the Western States. Published in the Journal.

By James E. Powell. On the Habits of the Moose.

By Prof. A. Retzius, of Copenhagen: On artificially formed Skulls from the Ancient World.

By William Stimpson, two, to wit: Descriptions of some new Invertebrata from the Chinese and Japanese Seas, &c., Part I.; Description of some new Marine Invertebrata, Part II.

By Phillip R. Uhler: Descriptions of some *Coleoptera* supposed to be new.

By Charles M. Wetherill, M. D., Ph. D.: Chemical Notices.

In all forty-five.

All of which is respectfully submitted by,

B. HOWARD RAND, Recording Secretary.

The Society then proceeded to an election for Standing Committees for 1856, which resulted as follows:

Ethnology, John S. Phillips, Samuel S. Haldeman, J. Aitken Meigs; *Comparative Anatomy and General Zoology*, Joseph Leidy, Edward Hallowell, John H. Brinton; *Mammalogy*, John L. Le Conte, John Cassin, William Camac; *Ornithology*, John Cassin, Edward Harris, George A. McCall; *Herpetology and Ichthyology*, Edward Hallowell, J. L. Le Conte, Gavin Watson; *Conchology*, T. A. Conrad, T. B. Wilson, Charles E. Smith; *Entomology and Crustacea*, Wm. S. Zant-

zinger, Robert Bridges, John A. Guez; *Botany*, R. Bridges, Wm. S. Zantzing, Elias Duraud; *Mineralogy*, Wm. S. Vaux, Samuel Ashmead, F. A. Genth; *Geology*, Isaac Lea, Charles E. Smith, J. L. Le Conte; *Paleontology*, T. B. Wilson, Joseph Leidy, W. Frederick Rogers; *Physics*, B. Howard Rand, Fairman Rogers, F. A. Draper; *Library*, Robert Pearsall, S. Weir Mitchell, H. Cooper Hanson; *Proceedings*, Wm. S. Zantzing, Joseph Leidy, George A. McCall.

ELECTION OF MEMBERS AND CORRESPONDENTS.

William M. Uhler, M. D., of Falls of Schuylkill, Joseph Wilson, M. D., U. S. Navy, Dr. Isaac J. Hayes, and Dr. Wm. Blackwood, of Philadelphia, Mr. Samuel Jeanes, of Philadelphia, and George Gibbs, Esq., of Stilacoon, Washington Territory, were elected *Members*;

And Dr. John H. Rauch, of Burlington, Iowa, and Dr. John W. Green, of New York, were elected *Correspondents*.

February 5th.

Vice-President BRIDGES in the Chair.

Letters were read—

From the Linnean Society of London, dated 12th December, 1855, acknowledging receipt of Proceedings and Journal of the Academy, and desiring missing numbers.

From Dr. I. J. Hayes, dated Philadelphia, 31st January, 1856, acknowledging receipt of his notice of election as a Member.

From Mr. W. W. Wood, dated Manilla, 4th Oct., 1855, transmitting specimens of Natural History for the Museum.

Dr. Leidy read a paper intended for publication in the Proceedings, entitled, "Notices of two new Ichthyodorulites." Referred to Prof. Haldeman, Mr. Isaac Lea, and Mr. A. H. Smith.

On motion of Prof. Haldeman, it was *Resolved*, That the privilege of endorsing tickets of admission to the Museum on public days, be granted to the Misses Malvina and Mary Lawson, of this city, and that they be invited to visit the Institution at all times.

February 12th.

Vice-President BRIDGES in the Chair.

Letters were read—

From Dr. Joseph Wilson, U. S. N., dated Philadelphia, Feb. 6th, 1856, acknowledging receipt of his notice of election as a Member.

From Mr. Samuel Ashmead, dated Key West, 23d Jan., 1856, transmitting a collection of objects of Natural History for the Museum.

From the American Philosophical Society, dated Feb. 6, 1856, acknowledging receipt of last No. of the Proceedings.

From the Smithsonian Institution, dated Washington, July 20th,

1855, and Dec. 7th, 1855, acknowledging receipt of late Nos. of the Proceedings and Journal and desiring missing Nos.

From the Boston Society of Natural History, dated 30th Jan., 1856, acknowledging receipt of late Nos. of the Proceedings.

February 19th.

Vice-President BRIDGES in the Chair.

Letters were read—

From the Lyceum of Natural History of New York, dated 18th Feb., 1856, acknowledging receipt of the Proceedings, Vol. 7, No. 12.

From the Smithsonian Institution, dated Washington, Jan. 7th, 1856, of the same tenor.

Dr. Le Conte presented for publication in the Proceedings, the following papers:—1. "Synopsis of the Mycetophagidæ of the United States;" 2. "Synopsis of the Phalacridæ of the United States;" 3. "Note on the genus *Lithodus* of Schoenheer;" 4. "Notice of three genera of Scarabæidæ found in the United States;" 5. "Analytical table of the species of *Chlænium* found in the United States;" all of which were referred to a Committee consisting of Mr. W. F. Rogers, Mr. Guex, and Dr. Zantztger.

Mr. W. F. Rogers presented a paper for publication in the Proceedings, entitled, "Synopsis of species of *Chrysomela* and allied genera inhabiting the United States." Referred to Dr. Le Conte, Mr. Guex, and Dr. Zantztger.

Mr. Cassin presented a paper for publication in the Proceedings, entitled, "Notes on North American Birds in the Collection of the Academy of Natural Sciences of Philadelphia;" which was referred to Dr. Wilson, Dr. Henderson, and Dr. Woodhouse.

Dr. Leidy presented a paper for publication in the Proceedings, entitled, "A Synopsis of Entozoa and some of their Ecto-congeners observed by the Author." Referred to Mr. J. P. Lesley, Dr. Le Conte, and Dr. Carson.

Also, a paper by the same, entitled, Notices of some remains of extinct Mammalia recently discovered by F. V. Hayden, in the 'Mauvaisés Terres' of Nebraska. Referred to Dr. Henderson, Mr. Isaac Lea, and Dr. Wilson.

February 26th.

Vice-President BRIDGES in the Chair.

The Committees on Dr. Hallowell's paper, read 15th January; Dr. Leidy's paper, read 5th Feb.; on Dr. Le Conte's papers, read 19th Feb.; on Mr. W. F. Rogers' paper, read same date; on Mr. Cassin's paper, read same date; and on Dr. Leidy's papers, read same date, severally reported in favor of publication in the Proceedings.

Description of several species of Urodela, with remarks on the geographical distribution of the Caducibranchiate division of these animals and their classification.

By EDWARD HALLOWELL, M. D.

CLASS REPTILIA.

Fourth order, Batrachia, Brogn.

Sub. class, Amphibiens Ichthyoides ou Nudipelliferes, Blainv.

Class Amphibia, Bonap.

Second order, Salamandræ, Bonap.

Second order, Dipnoa, Leuckart, Fitzinger.

First tribe, Dipnoa mutabilia.

Fifth family, Salamandroidea, Fitz.

Order, Ranæ. Second division, Ranidæ candatæ, Wagler.

Second sub order, Batrachia gradientia, Merrem and Gray.

Batrachia. Third sub order, Urodèles, Dum.

First family, Atrè odères ou salamandrides.

Sub family, Ambystomina, Gray.

Genus, Ambystoma, Tschudi.

AMBYSTOMA LATERALE, nob.

This animal is smaller than any of the species of Ambystoma with which we are acquainted, with the exception of *A. macrodactylum*, being about the size of *Salamandra nigra*, Green.

Color jet black above, black below, with a tinge of brown especially upon the throat; the sides of the body and tail are marked with numerous white spots about the size of a pin's head, and even larger, thickly agglomerated; they are also observed of greater dimensions upon the sides of the neck; the chin and throat present numerous white spots, smaller than those upon the sides; they occur, also, sparsely upon the abdomen; extremities spotted with white, both above and below; fingers and toes banded with the same; a gular fold; palatine teeth in a transverse, undulating, interrupted series, as in *Ambystoma fasciatum*, (See Dum. and Bib., pl. 101, fig. C.) passing behind the internal nares; no longitudinal rows of teeth; tongue attached in front and behind, free at its lateral edges; tail compressed, longer than the body; extremities slender, middle fingers of nearly equal length; first and fourth idem; first toe shorter than fifth; second than third, fourth than fifth; fingers and toes free, slender, depressed; ten distinct costal folds.

Dimensions.—Length of head 4 lines, breadth $2\frac{1}{2}$; of body from gular fold to vent, 1 inch $2\frac{1}{2}$ lines, (Fr.); of tail 1 inch 5 lines; length of anterior extremities 6 lines, of posterior 7.

Habitat.—Marquette, southern border of Lake Superior, specimen in Mus. of Acad. N. S., presented by Dr. John L. Le Conte, who found it in that region, with a fine specimen of *Ablabes punctatus*, Dum. and Bib. No mention is made of any species of Urodèles in the work on Lake Superior, by Professor Agassiz, with the exception of *Plethodon erythronotus*. The reptiles enumerated in it are *Tropidonotus sirtalis* and *Tropidonotus erythrogaster*, a species allied to *rigidus*, an undetermined species of *Crotalophorus*, probably *tergeminus*; *Rana nigricans*, *Rana halerina*, *Rana sylvatica*, *Hylodes maculatus*, *Bufo americanus*. *Plethodon erythronotus* and *Menobranchius maculatus*.* I have since found another specimen much older, and having a general brownish tint, (altered by alcohol,) but with the lateral spots quite distinct, among the reptiles of the (Green collection presented to the Academy by Dr. Franklin Bache, with no indication of locality.

General Remarks.—The *Ambystoma* above described resembles none other of our well known species, and will, therefore, be readily recognized. *Amb. punctu-*

*To these may be added *Coluber occipito-maculatus* Storer. (*Col. venustus*, Hallowell, *Proceed. Acad. N. S.*, vol. iii., p. 280, pl.)

latum, Gray, (Cat. Br. Mus. Amphib. p. 37, No. 5,) is represented as lead colored, and white beneath with distant scattered white dots upon the cheek and upper part of sides. Its habitat is Monterey, California. It is unknown to us. *Ambystoma laterale* is somewhat similar in coloring to *Sal. niger*, Green, but that is a *Plethodon*, having a head and tail, and an arrangement of teeth altogether different; viz., two small arched rows behind the internal nares, the convexity presenting forward, converging toward each other, and separated by an interval, with two series of thickly set, longitudinal sphenoidal teeth, closely approximated, arranged somewhat like a brush, and separated from the vomerine by an interspace without teeth. The *Ambystoma nigrum* of Dum. and Bib., is also a *Plethodon*, and is, no doubt, identical with *Plethodon fuscum* as the synonymes show; (*Sal. niger*, Green, *Desmognathus niger*, Baird,) and *Plethodon fuscum** being the same, they not having seen the animal. *Salam. erythronota*, Green is erroneously placed by Gray, (Cat. Br. Mus. Amphib. Grad. p. 37. No. 9.) among the *Ambystomata*. It is a *Plethodon* as Dumeril and Bibron have it. *Ambystoma quadrimaculatum* and *Ambystoma salmoneum*, Dum & Bib. belong to other genera. The first is a *Plethodon*, the latter has the transverse and longitudinal rows of teeth in a continuous series, in this respect resembling none other of our Urodèles with the exception of *Sal. rubra*, Green, (*Bolitoglossa rubra*, D. & B.) *Pseudotriton rubra*, Tschudi. Dum. & Bib. have also put *glutinosum* and *auriculatum* in the genus *Cylindrosoma*. They are both *Plethodontes*.†

The genus *Salamandra* does not exist, so far as is known, on the American Continent. On the other hand, *Ambystoma* is an exclusively American genus, and has a wide range. Its most northern limit at present, is Lake Superior; its southern, New Mexico. It is found in Maine, Pennsylvania and South Carolina, (punctatum or venosum Bart.) Massachusetts, Ohio, Maryland, Virginia, Georgia, Mississippi, (opacum Grav. or fasciatum, Gr.) New York and New Jersey, (tigrinum,) Oregon, (macrodactylum, Bd.) Michigan, Wisconsin and Illinois, (luridum) ingens (*Xiphonura* Tsch.) New Orleans.

It is a remarkable fact that none of the animals belonging to the sub-order *Batrachia gradientia* of Merrem and Gray, (*Batrachia urodela*, Dum. and Bib.,) and especially the Urodèles atrétodères or Salamandrides, have been discovered in America south of Mexico, although so numerous in the northern part of that great continent. Nor are any of the caducibranchiate-tailed batrachians known to exist in the East Indies, Persia, China, Australia, Borneo, Sumatra, Java, New Zealand, the Philippines, New Holland, New Guinea, West or Southern Africa, or, so far as is known, with the exception of Japan and Loo Choo, in any of the numerous islands of the Atlantic‡ and Pacific Oceans. They are found in the south of Spain and northern part of Africa, (Pleurodeles,) the islands of the Mediterranean, various parts of England, France, Germany and Italy, (*Salamandra*, *Triton*, *Geotriton*, *Euproctus*,) the north of Africa, Syria, (*Triton*?) and Japan, (*Cynops*, *Onychodactylus*, *Ellipsoglossa*,) but appear to be more abundant in North America, and comprise genera not yet observed in other parts of the world, viz., *Ambystoma*, Tsch., which contains many species, *Plethodon*, Tsch., *Desmognathus*, Bd., *Spelerpes*, Raf., *Taricha*, Gray, *Pseudotriton*, Tsch., *Hemidactylum*, Tsch., *Batrachoseps*, Bonap., *Ensatina*, Gray, and *Diemictylus*, Raf.

There is not only not any true *Salamandra* in the United States, but no *Triton*,

*As universally yellowish brown or black," Eight, DeKay, Nat. Hist. of New York, Reptiles, p. 85; the brown specimens, the young according to Dr. Holbrook.

†The *Salamandra Jeffersoniana* of Prof. Holbrook is no doubt a *Plethodon*, perhaps identical as well as *S. Jeffersoniana*, Green, with *Plethodon glutinosus*, Tschudi represents the teeth as transverse in his *Xiphonura Jeffersoniana*. Is *X. Jeffersoniana*, Tsch. identical with *Ambystoma ingens*?

‡Prof. Schlegel states that a species approaching *S. longicauda* was brought from Martinique by Mr. Plée, Fauna Japonica, Reptiles, p. 119.

properly so called, for the Triton dorsalis and symmetricus of authors is anatomically quite different from the Tritons of Europe.

The tongue in the genera Spelerpes, Pseudotriton (Mycetoglossus, Bib., Bolitoglossa, D. and B.) and Batrachoseps, Bonap., is bolitoglossal or mushroom-shaped, being quite free and supported upon a central pedicel; but the arrangement of the teeth is not the same, the transverse and longitudinal rows being separated by an interval in Spelerpes and Batrachoseps, but, as before stated, are in a continuous series in Pseudotriton. The only European genus which agrees with the first named genera in the form of tongue and arrangement of teeth, is Geotriton, the tongue in the Tritons proper being attached both in front and posteriorly, and having no transverse teeth whatever;* but in Geotriton the toes are very distinctly palmated, which is not the case in either Batrachoseps or Spelerpes, so that not only the species of Urodèles, new under consideration, are different, but the genera also, no two being identical in both continents; further, if we restrict the families more fully than has hitherto been done, we might say that the only sub-families of this group of reptiles common to both Europe and America are the Bolitoglossidæ, or the mushroom-tongued Urodèles, comprising in the former several genera, in the latter but one, and the Tritonidæ.

It is also worthy of remark that, although these animals are known, (instead of having the power to remain unharmed amidst the flames, according to the opinion of the vulgar, or of "inhabiting the rivers of hell,"†) to be capable of enduring extreme cold, (the Salamandra atra existing near the region of snow in the Alps,) they have not yet been discovered very far north. None of the American species have been found north of Lake Superior except Plethodon erythrinotus, and that at no great distance. In Europe the most northern limit is Sweden. None of these reptiles, we believe, were observed in the recent expedition of Dr. Kane to the Arctic regions.‡

In making out a synopsis of the Urodèle Batrachians in the collection of the Academy, I had laid aside for future examination the Triton porphyriticus, of which we have but a single specimen and which is really an Ambystoma. The true position of this animal appears to have been quite doubtful. Prof. Green describes it as a Salamandra, Prof. Holbrook, a Triton, Mr. Gray, a Spelerpes, with a note of interrogation, and Prof. Baird, in his valuable synopsis of the group of reptiles to which it belongs, states that its place probably is among the Ambystomata, but previously remarks that Pseudotriton salmoneus and the Salamandra porphyritica of Green will very probably turn out to be identical. Should this be the case, Pseudotriton salmoneus becomes P. porphyriticus, and the species now described will require a new name.

AMBYSTOMA PORPHYRITICUM.

Syn. Sal. porphyritica, Green, Maccl. Lyceum, p. 3. pl. 1. Sal. porphyritica, Harian, Med. & Phys. Res. p. 98. Triton porphyriticus, Holbrook, N. Am. Herp., vol. v. p. 83.

* Dr. Holbrook is in error in stating that Triton dorsalis has transverse teeth.

† In allusion to the Tartarean *habitat* of these creatures, a writer in the London Quarterly Review remarks, that Scott's conversation "was rich in ease, sense and humor, while theirs (certain smart and perverse, but unwholesome disputants) was like the breakfasts in military novels, which seem to consist chiefly of devilled kidneys, grilled bones, and other fierce and *salamandrine* elements."

The Salamanders are covered with numerous pores, which exude an acrid and glutinous fluid, so that if thrown upon live coals they become blackened, but of course the animal is soon destroyed.

‡ The most northern limit of reptile life observed by Sir J. Richardson, (see boat voyage in search of Sir John Franklin,) was the north bend of Porcupine River, within the Arctic circle, where a snake was found. The tortoises disappear beyond the 51st degree, at the south end of Lake Winnipeg, (Emys geographica and probably the snapper,) the frogs at 68°, (Bufo americanus and Hyla versicolor.)

Char. General form more slender than that of most of the Ambystomata. Head small, convex above, rounded in front; eyes latero-superior, prominent; tongue ovoid, firmly attached in front and posteriorly, more free at the sides; internal openings of the nares moderately large; teeth in a transverse uninterrupted row, arched in front,* concave posteriorly; no longitudinal rows of teeth; a gular fold; no parotids; skin perfectly smooth to the touch, presenting innumerable small pores when observed with a glass; of a uniform brownish color above, lighter below; no line of lateral pores between the axilla and groin; fingers and toes free, rather slender, depressed, fourth toe longer than the third; tail much compressed, shorter than head, neck and body.

Habitat.—Wabash. One specimen in Mus. Acad. Nat. Sc., presented by Dr. McMurtrie. Prof. Green's specimens were found in French Creek, near Meadville, Crawford County, Pennsylvania.

Dimensions.—Length of head 4 lines; breadth $3\frac{1}{2}$; length of neck and body to vent 1 inch 7 lines; (Fr.) of tail 1 inch 9 lines.

Gen. remarks.—The whitish spots mentioned by Prof. Holbrook, arranged in a linear longitudinal series along the flanks, and also by Dr. Green, are not visible in the specimens above described, probably from long immersion in alcohol. It is a larger animal than *Ambystoma laterale*, and differs from it much in the arrangement of the transverse teeth and in the coloration. A good figure and excellent description of it will be found in Prof. Holbrook's work on the North American Reptiles.† The Triton porphyriticus of Dr. DeKay (Nat. Hist. of New York, Reptiles, p. 85) is *Plethodon glutinosus*, judging from the description;‡ no mention being made of the teeth. The arrangement of the teeth in the species of *Ambystoma* varies considerably, and with the size of the internal nares, appears to form very good *specific* characters. Dr. Green's description corresponds in almost every important particular with the animal above described, except the head, which, instead of being "rather large," is on the contrary small. He states that "the color on the back varies very much in different specimens, some being dark chocolate, others of a much lighter color, and others again of a pale brown; the young is nearly white, with a middle line on the sides extending from the anterior to the posterior extremities," (Mach. Lyc. p. 3.) Prof. Holbrook's specimen was 4 inch. 5 lines in length; Dr. Green's between 5 and 6 inches. Prof. Holbrook's drawing is much more accurate than that of Prof. Green, which, although more highly finished, does not correspond very closely with the specimen in the collection of the Academy, the head resembling more that of *Pseudotriton salmoneus*, (*Sal. salmonea*, Storer.)§ Prof. Holbrook observes that he had never seen the animal alive, but the coloring was taken from the original of Dr. Green.

Some years ago I described in the Proceedings of the Academy, a new Salamander from California, under the name *lugubris*. Mr. Gray, in the Catalogue of the British Museum, places it along side of *Taricha*, with a note of interrogation. It is however very different from *Taricha*. The species was subsequently made the type of a new genus by Prof. Baird, with the name *Aneides*.

* In glutinosus this is not the case; the vomerine teeth are separated by a wide interval and take another course; sphenoidal teeth in glutinosus, none in *Ambystoma*; the fingers and toes are also different.

† The palate, he observes, "is armed with a row of *transverse* teeth."

‡ He says, tail cylindrical, scarcely compressed. In *porphyriticus* the tail is much compressed; in *P. glutinosus* cylindrical; the shape of the tail and the teeth distinguish it at once from *glutinosus*.

§ The small eyes and irregular whitish spots in the description do not apply to *Salmoneus*; the snout is described as obtuse, which it is in *porphyriticus*; in the drawing it is truncate.

The following notes are somewhat more precise than those of the former description.

Sub. fam. PLETHODONTIDÆ.

Gen. ANEIDES, Baird.

Char.—Head large, swollen at the temples, snout angular, eyes very prominent; tongue obcordate, more or less truncate posteriorly, attached in front, and along the middle, sides quite free, quite free posteriorly, but less so than at the sides; maxillary teeth greatly developed, especially those of the lower jaw, which are spear-shaped, sharp-pointed, more or less convex anteriorly, concave posteriorly, with a ridge in the middle, about $\frac{2}{3}$ of a line in length; vomerine teeth in two convergent rows, behind the internal nares meeting posteriorly, their convex surfaces presenting inward*; sphenoidal teeth very numerous, sharp pointed, thickly set like a brush in two rows, closely in contact in the anterior third, posteriorly a very narrow linear interspace, not enlarged behind; in the *original* specimen, this narrow interspace is not so distinct, so that they might almost with propriety be described as a single row; extremities slender; fingers and toes slightly compressed, free; 1st finger much shorter than 4th; 2d shorter than 3d; 1st toe much shorter than 5th; 2d than 3d; 3d and 4th of equal length; skin smooth, costal grooves well marked, twelve or thirteen in number, tail round, tapering to a point, very slightly compressed at tip, about same length as head, neck and body.

ANEIDES LUGUBRIS.

Syn.—*Sal. lugubris*, Hallowell, *Proceed. Acad. Nat. Sci.*, vol. iv. p. 126. *Aneides lugubris*, Baird, *Iconographic Encyclopædia*, vol. ii. 1859, 1st edition, p. 256. *Taricha lugubris*? Gray, *Cat. Br. Amph.*, p. 26, No. 2.

Char.—Color dark olive above, yellow below, without spots or other markings, a row of small, circular spots on each side.

Dimensions.—Length $4\frac{1}{2}$ inches.

Habitat.—Monterey and San Francisco, Upper California. Two specimens in *Mus. Acad. Nat. Sci.* Presented by Dr. Townsend and Mr. Heermann.

The *U. atrétodères* may be subdivided into the following groups, which will perhaps facilitate their study.

a. With longitudinal teeth.

1. SALAMANDRIDÆ. European.

Tongue rather large, attached in front and posteriorly, free at the sides; toes 4—5.

1 gen. *Salamandra*. 3 sp. *maculosa*, *corsica*, *atra*.

2. SEIRANOTIDÆ. European.

Tongue well developed, oblong, rounded in front, broader and almost truncate posteriorly, free in its posterior half, less so laterally, attached in front, toes 4—4.

1 gen. *Salamandrina*. 1 sp. *S. perspicillata*.

3. PLEURODELIDÆ. N. African and S. European.

Tongue small, subcircular, free posteriorly, and at the sides, attached in front; toes 4—5; ribs not rudimentary, but much developed, perforating even the integuments.

4. TRITONIDÆ. European, N. American, Asiatic.

Tongue fleshy, papillose, well developed, attached in front and behind, free at the lateral edges; toes 4—5.

* The true position of this animal is among the *Plethodonts*, that of *Taricha* the teeth of which are in two slender longitudinal series, commencing on a line with the inferior margin of the internal nares, about midway between them, but diverging widely posteriorly, among the *Tritonida*.

5 gen. *Euproctus*, *Cynops*, *Diemyctylus*, *Taricha*, *Triton*. 10 sp. *E. Rusconi*, *C. pyrrhogaster*, *D. viridescens*,* *Taricha torosus*, *Triton alpestris*, *cristatus*, *marmoratus*, *palmatus*? *punctatus*, *pyrenæus* and perhaps others.

5. ELLIPSOGLOSSIDÆ. Asiatic.

Tongue oblong oval, free at the sides only; toes 4—5.

1 gen. *Ellipsoglossa*. 1 sp. *E. nivia*.

5. With transverse and longitudinal teeth.

6. PLETHODONTIDÆ. N. American.

Tongue broad oval, well developed, free at its lateral edges and posteriorly, attached in front; toes 4—5.

3 gen. *Desmognathus*, *Aneides*, *Plethodon*. 6 sp. *D. niger*, *auriculatus*, *A. lugubris*, *P. glutinosus*, *erythronotus* and *quadrifasciatus*?

7. BOLITOGLOSSIDÆ. N. American and European.

Tongue of moderate size, mushroom-shaped, supported by a central pedicel; toes 4—5 and 4—4.

4 gen. *Batrachoepe*, *Spelerpes*, *Pseudotriton*, *Geotriton*. 9 sp. *B. quadridigitatus*, *attenuatus*, *S. longicauda*, *guttato-lineata*, *bi-lineata*, *mexicana*, *P. ruber* and *salmonæus*, *G. fuscus*.

8. HEMIDACTYLIDÆ. N. American.

Tongue oval, attached in front and along the middle, more free posteriorly; toes 4—4.

1 gen. *Hemidactylum*. 1 sp. *H. scutatum*.

c. Transverse, but no longitudinal teeth.

9. AMBYSTOMIDÆ. N. American and Asiatic.

Tongue ovate, moderately free at its edges, slightly so in front, attached posteriorly; toes 4—5.

2 gen. *Onychodactylus*, *Ambystoma*, 15 sp. *O. japonicus*, *A. punctatum* (*venosum* Bart.) *opacum* Grav. (*fasciatum* Green) *laterale*, *pophyriticum*, *macro-dactylum*, *punctulatum*,? *tigrinum*, *luridum*, *nebulosum*, *mavortium*, *episcopus*, (*an hypoxanthus* Raf.) *talpoideum*, *proserpine*, *tenebrosus*, and no doubt others.

Description of two *Ichthyodorulites*.

By JOSEPH LEIDY, M. D.

STENACANTHUS NITIDUS Leidy. The species of a genus supposed to be distinct from those which have been described, is indicated by an *ichthyodorulite*, discovered by Charles E. Smith, Esq., in association with the remains of *Holoptychius*, in the old Red Sandstone formation of Tioga county, Pennsylvania. The specimen is partially imbedded in a mass of red sandstone; and it has its point broken off and is otherwise mutilated. The spine is straight throughout and indicates no disposition to curve. In its perfect condition it appears to have

* *D. viridescens* Raf. (*Tr. dorsalis*) and *D. miniatus* (*Tr. symmetricus*) are probably the same, the orange color and roughness being appearances which the female more especially presents after a long sojourn on land. At least this may be inferred from what is known of the habits of the European *Tritons*. Schlegel says that such is the case with *T. punctatus*. He also remarks that he has specimens of *marmoratus* (one of the very roughest of the *Tritons*, if we may judge from the specimen in the Bonaparte collection) perfectly smooth, and we have those of *dorsalis* smooth and more or less rough. The *Triton marmoratus*, according to Kaup, leaves the water in June and becomes a land animal; the crests of the male disappear, and the tail, from a swimming organ, becomes round.

been about three inches in length, by about six lines in breadth at its base; and it gradually tapers towards the apex. The anterior margin is convex. The posterior border at the edge of the exposed surface of the fossil is furnished with a row of closely set serrations, directed obliquely downward, of which eight may be counted within the space of seven lines. Whether there is a second row of serrations, the imbedded state of the very friable bone in a hard matrix will not permit me to determine.

The broad surface which is exposed in the specimen, so far as it is preserved, is longitudinally furrowed; and about three-fourths of an inch from the broken summit it exhibits a transverse zigzag fissure, which may probably be the result of an original fracture, although it has very much the appearance of being an articulation.

CYLINDRACANTHUS ORNATUS Leidy. On several occasions fragments of apparent fossil bones have been submitted to my inspection, the character of which has exceedingly puzzled me, and although I now view them as portions of ichthyodorulites, I am not positive of the correctness of my conclusion. The specimens alluded to are found in the cretaceous formations of New Jersey and Alabama. The most perfect one was obtained by W. Taylor, Esq., from near Pemberton, Burlington co., New Jersey. It is over three inches in length with the extremities broken off, is straight and gradually tapering, and is perfectly circular in transverse section. At the thicker end it is six and one quarter lines in diameter, and at the other end five lines. The centre presents a double tubular perforation of comparatively small calibre. The surface is invested with a thick, enamel-like layer, which is dense, brittle, and shining, and deeply fluted; the intervening ridges being of nearly uniform diameter, with pairs occasionally converging into single ones in their course.

Synopsis of the MYCETOPHAGIDÆ of the United States.

By JOHN L. LE CONTE, M. D.

The genera of this family of Coleoptera which have been thus far discovered in the country, are *Mycetophagus*, *Litargus*, *Typhæa*, and *Diphyllus*. Of the latter genus two species are known to me, one found by Dr. Melsheimer in Pennsylvania, and the other by me at Tucson, in the valley of the Gila. I regret that the absence of the specimens prevents me from making them known on the present occasion. Thus if *Diplocælus* be combined with *Diphyllus* as recommended by Lacordaire (Gen. Col. 2, 447,) the only genus left unrepresented in the United States, will be *Triphyllus*. Of the described species none are unknown to me.

The genera may be thus separated:

Tarsi maris antici 3-articulati; (thorax versus latera haud carinatus)

Oculi transversii;

Antennarum clava elongata, multiarticulata

Mycetophagus.

{ Antennarum clava triarticulata; (elytra confuse punctata)

Triphyllus }

Oculi rotundati; antennarum clava triarticulata.

Ligula membranæ

Litargus.

Ligula corneæ

Typhæa.

Tarsi omnes subpentameri; antennæ clava biarticulata; (thorax utrinque bicarinulatus)

Diphyllus.

MYCETOPHAGUS Hellwig.

A. Antennæ extrorsum sensim incrassatæ; thorax lateribus haud serratus.

1. *M. punctatus*, ovalis infra rufo-testaceus, capite thoraceque nigris dense punctatis, elytris flavis macula scutellari, margine laterali, macula discoidali mox pone medium, fasciæque lata ante apicem nigris, ore antennisque rufescentibus, his clava nigra, ad apicem testacea; pedibus flavo-testaceis. Long 21—25.

Say, Journ. Acad. Nat. Sc., 5, 260.

Middle and Southern States.

2. *M. flexuosus*, ovalis, testaceus, capite thoraceque nigris confertim punctatis, elytris flavis, puncto humerali, macula communi scutellari, margine laterali, maculis extrorsum confluentibus versus medium, fasciæque lata dentata ad dodrantem nigra, apice ipso piceo; antennis testaceis, clava nigro-picea ad apicem testacea. Long. .15.

Say, Journ. Acad. Nat. Sc., 5, 260.

Middle and Western States. Allied to the preceding, but smaller and with the posterior band broader, less near the apex, and anteriorly dentate, and with three confluent spots forming an irregular external transverse band near the middle.

Varies in having the black spots very much extended so as to cover the greater part of the elytra which then become marked:

a. With a large orange colored humeral spot enclosing a black dot, and extending inwards below the scutel nearly to the suture; two very small spots a little behind the middle, and a larger rounded one very near the apex. Alabama, Mr. Haldeman.

b. With a quadrate humeral orange colored spot enclosing a black dot, and a rounded one very near the apex. Indiana, Mr. J. P. Wild.

3. *M. pluriguttatus*, ovalis longiusculus, niger, capite thoraceque dense punctatis, elytris guttis pluribus flavis parvis præcipue mox pone medium ornatis, antennis pedibusque obscure ferrugineis. Long. .2.

San Jose, California. The posterior third of the elytra is usually free from spots, sometimes a very small one is seen near the apex.

4. *M. Melsheimeri*, elongatus, ferrugineus, capite thoraceque confertim punctatis nigris, elytris flavis macula communi scutellari, margine lobato ad apicem latiore, macula transversa communi media cum margine bis conflente nigris, (macula hac ultima sæpe deficiente), fortiter punctato-striatis, antennis medio obscurioribus. Long. .17.

Mycetophagus bimaculatus Mels. Proc. Acad. Nat. Sc., 2, 114 (in parte).

Pennsylvania, Dr. Melsheimer; Alabama, Haldeman. I have been compelled to change the name proposed by Dr. Melsheimer, as by an unfortunate error his description was made from two distinct species, one being *M. flexuosus*, while the other is the present: it, however, affords me much pleasure to commemorate his long continued and successful labors in American Entomology by attaching his name to this species, which he was the first to detect.

5. *M. obscurus*, elongatus, piceo-niger, capite thoraceque dense punctatis, elytris fortius punctato-striatis; antennis piceis ad basin et apicem ferrugineis, pedibus piceis tibiis tarsisque rufescentibus. Long. .17.

One specimen, Georgia. Of the same form and with the same sculpture as *M. Melsheimeri*.

B. Antennæ articulis 5 ultimis crassioribus; thorax lateribus serratis.

6. *M. pluripunctatus*, elongatus, ovalis, nigro-piceus, capite thoraceque nigris dense punctatis, elytris flavis margine, macula communi scutellari, guttisque plurimis confluentibus nigris; abdomine pedibus antennisque ferrugineis. Long. .16.

Middle and Southern States: the spots sometimes form several narrow, irregular, transverse fasciæ.

7. *M. pini*, elongatus ovalis, supra niger, subtus cum antennis pedibusque rufis. Long. .14—16.

Ziegler, Proc. Acad. Nat. Sc., 2, 270.

Middle and Southern States, not rare.

C. Antennæ articulis 4 ultimis maioribus; thorax lateribus haud serratus.

8. *M. obsoletus*, ovalis infra rufus, supra niger, elytris fascia dentata antica basin attingente, ad suturam paulo interrupta, macula laterali ad medium,

duabus pone medium quartaque ante apicem rufis; antennis testaceis, articulis 8—10 nigris, ultimis tribus abrupte maioribus. Long. .2.

Mels. Cat. Descr. Col. of U. S., 47.

Tetratoma oboleta Melsheimer, Proc. Acad. Nat. Sc. 2, 113.

Middle States. The anterior fascia is sometimes broken into two spots: on the other hand, the spot behind the middle sometimes combine into a dentated fascia.

9. *M. bipustulatus*, longiusculus magis convexus, ovalis, supra piceus, infra obscure rufus, elytris guttis duabus pone basin saepe confluentibus, altera magna obliqua pone medium obscure rufis, antennis articulis quatuor ultimis distincte maioribus. Long. .13.

Melsheimer, Proc. Acad. Nat. Sc. 2, 114.

Middle States, not rare. In the Catalogue of Described Coleoptera of the United States, Dr. Melsheimer has changed the name of this species to *M. bisignatus*, under the impression that the name had been previously employed. I do not, however, find any other described species named *bipustulatus*, and have therefore replaced the name first given.

LITARGUS Er.

1. *L. tetraspilatus*, ovalis sub-convexus, nigro-piceus, pubescens, elytris distinctius sat dense punctatis seriatim pubescentibus, macula magna antica alteraque postica rufo-testaceis, margine thoracisque angulis posticis rufescentibus, antennis tibiis tarsisque testaceis. Long. .08.

A very pretty little species, found in the Southern and Western States. Broader than *L. didesmus*, and readily known by the hairs of the elytra being arranged in rows.

2. *L. sexpunctatus*, elongatus ellipticus depressus, niger, pubescens, elytris densius subtilius punctatis, pubescentibus, pilisque longioribus parce seriatim, macula humerali, altera pone basin, tertiarque maiore obliqua transversa ad dodrantem testaceis, tarsis antennarum basi et apice testaceis. Long. .09.

Er. Ins. Deutschl. 416.

Mycetophagus sexpunctatus Say, Journ. Acad. Nat. Sc. 5, 261.

Middle and Southern States.

3. *L. transversus*, subelongatus ellipticus depressus niger, pubescens, elytris subtilius punctatis, pilis seriatim, macula humerali, altera pone basin, fasciarque angusta transversa dentata ad dodrantem testaceis; antennarum basi pedibusque piceo-testaceis. Long. .10.

One specimen found at San Jose, California.

4. *L. infulatus*, subelongatus, ellipticus, subdepressus piceus, pubescens, thoracis elytrorumque marginibus indeterminate testaceis, his maculis utrinque duabus ad basin, altera pone basin, fasciarque angusta obliqua subdentata postica pallidis, confertim punctulatis, subseriatim pilosis; subtus testaceus. Long. .07.

One immature specimen found in Illinois, by Mr. Willcox. This species seems by the arrangement of the colors to be very distinct from any other found on the Atlantic slope. It differs from the preceding by the distinct punctuation of the elytra, and from the next by the same characters, and by the posterior band being narrow, as well as by the anterior pale spots not occupying nearly half the surface of the elytra.

5. *L. balteatus*, subelongatus, ellipticus subdepressus, rufo-piceus pubescens, capite elytrisque obscuris, his trientem anticam, macula parva laterali fasciarque postica obliqua lata dentata pallidis, confertim subtiliter punctulatis; antennis pedibusque pallide testaceis. Long. .07—.085.

Colorado river, California, near the junction of the Gila. The pale markings of the elytra are so large that they may be described as pale with the apical fourth and a broad band at the middle obscure; the latter is dilated externally and includes a pale spot. The hairs of the elytra do not appear to be arranged in rows.

6. *L. didesmus*, ellipticus paulo convexus, nigro-piceus fortius dense punctatus, pubescens, elytris fascia subbasali alteraque pone medium obscure rufo-testaceis, haud seriatim pubescentibus; antennis pedibusque piceo-testaceis. Long. .07—.09.

Er. Ins. Deutschl. 416.

Mycetophagus didesmus Say, Journ. Acad. Nat. Sc. 5, 261.

Middle and Southern States; common.

7. *L. nebulosus*, ellipticus paulo convexus, subtus nigro-piceus, supra obscure piceo-testaceus, fortius punctatus pubescens, elytris piceo-nebulosis, antennis pedibusque piceo-testaceis. Long. .06—.08.

Maryland; Dr. Zimmermann and Mr. Wild. Broader, more convex and less densely punctured than *L. didesmus*. The dark marks of the elytra are sometimes very indefinite; in pale colored specimens they are more distinct, forming a spot on each elytron partly surrounding the humerus, and two transverse undulated bands, the first a little before the middle, and the second at the second third of their length: these bands do not reach the sides.

TRYPHMA Curtis.

T. fumata, elongata, ovalis paulo convexa, ferruginea, luteo-pubescens, elytris subtiliter punctato-striatis, punctulatis, seriatim pilosis. Long. .1—.11. Curtis, Brit. Ent. 15, pl. 702. Er. Ins. Deutschl. 418, (ubi synonym. Europ. invenies).

Dermestes fumatus Linn. Syst. Nat. 2, 564.

Cryptophagus gilvillus Mels. Cat. Descr. Col. of U. S. 45.

Cryptophagus crenatus Mels. Proc. Acad. Nat. Sc. 2, 114.

Distributed by commerce over all parts of the world. The last synonyms are known to me by a specimen kindly communicated by Dr. Melsheimer; they were incorrectly referred by me, (Proc. 7, 217,) to *Litargus*.

Synopsis of the PHALACRIDÆ of the United States.

By JOHN L. LE CONTE, M. D.

In this family are contained four genera, first separated by Erichson; and since all with the exception of *Tolyphus* are found in our territory, I have here transcribed the table of genera given by him. (Ins. Deutschl., 108.)

1. Tarsi æquales; Tibiæ calcaribus	{ obsoletis	PHALACRUS.
	{ distinctis	TOLYPHUS.
2. Tarsi postici elongati, articulo 1mo	{ 2do brevior	OLIBRUS.
	{ 2do longior	LITOCERUS.

PHALACRUS Payk.

Palpi maxillares articulo ultimo cylindrico: tibiæ compressæ spinulosæ calcaribus obsoletis: tarsi æquales, articulo 1mo breviusculo: femora compressa inferne ciliata.

Usually shorter and more obtuse than *Olibrus*; the sutural stria in the native species is distinct, and the club of the antennæ elongate, with the last joint obtusely rounded at the tip.

A. Thorax ad basin distincte licet subtilissime marginatus.

1. *P. seriatu*s, ovalis paulo convexus, nitidus niger, elytris confertim seriatim punctulatis, versus basin fere lævibus; antennis ad basin palpisque testaceis. Long. .1.

One specimen, Kansas. Longer and less convex than the other species, and known by the testaceous palpi.

2. *P. ovalis*, ovalis convexus, nitidus niger, elytris obsoletissime substriatis, prope stria seriatim subtilissime punctulatis; antennis ad basin testaceis. Long. .08—.10.

Two specimens, San Diego, California. The body tapers a little posteriorly in

the male, but is regularly oval in the female. Differs from the next by the longer form.

3. *P. penicillatus*, breviter obtuse ovalis, convexus, niger nitidus, elytris obsoletissime substriatis, prope strias seriatim subtilissime punctulatis: antennis ad basin piceis. Long. .13.

Say, Journ. Acad. Nat. Sc., 4, 91.

Kansas and California. By its larger size this species may be distinguished.

4. *P. politus*, breviter obtuse ovalis, niger nitidus, elytris obsoletissime substriatis, prope strias subtilissime seriatim punctulatis, antennis piceis, ad basin palpisque testaceis. Long. .08.—.09.

Mels. Proc. Acad. Nat. Sc., 2, 102.

Middle and Southern States, abundant. Very similar in form and sculpture to the preceding, but differs by the smaller size and testaceous palpi. The male is slightly narrowed behind.

5. *P. pumilio*, breviter obtuse ovalis, niger nitidus, elytris obsoletissime substriatis, prope strias subtilissime seriatim punctulatis, tibiis tarsis palpis antennisque fusco-testaceis, his clava obscura. Long. .05.

Two specimens, Georgia: very considerably smaller than *P. politus*, which it otherwise resembles.

B. Thorax ad basin vix conspicue marginatus.

6. *P. simplex*, ovalis convexus postice angustatus, niger nitidus elytris obsoletissime substriatis, antennis ad basin piceis. Long. .10.

One specimen, Kansas. Nearly of the same form as *P. ovalis*, but somewhat attenuated behind, and without any rows of fine punctures upon the elytra, except very near to the apex.

OLIBRUS Er.

Palpi maxillares articulo ultimo ovali; tibiæ tenues, calcibus apicalibus concupis; tarsi postici reliquis longiores, articulo secundo longiusculo; femora haud ciliata.

A. Metasternum antice productum, cum mesosterno connatum, protuberans; (elytra striis internis duabus profundioribus).

1. *O. bicolor*, oblongo-ovatus, convexus, niger nitidissimus, elytris macula rotundata anteapicali ornatis, substriatis, striis duabus internis distinctis; infra rufus, antennis pedibusque testaceis. Long. .08.—.11.

Er. Ins. Deutschl. 116. (ubi synonym. invenies.)

Phalacrus bicolor Gyllenhal. Ins. Suec. 3, 431.

Middle States, not common. Perhaps imported from Europe.

2. *O. striatulus*, oblongo-ovatus, convexus, niger nitidus, elytris tenuiter striatis, interstitiis biseriatis subtilissime punctulatis; subtus cum antennis pedibusque rufo-testaceis. Long. .10.

Middle States and Kansas. Of nearly the same form as the preceding, but a little narrower with more distinct elytral striæ.

3. *O. rufipes*, oblongo-ovatus, convexus, niger, nitidus capite punctato, elytris tenuissime striatis, interstitiis biseriatis obsolete punctulatis: subtus nigro-piceus, antennis pedibusque rufis. Long. .08.

One specimen, Shoalwater Bay, Oregon, Dr. Cooper. Of the same form as the preceding, with the head more distinctly punctured.

4. *O. semistriatus*, oblongo-ovatus, convexus, nigro-piceus, nitidus, capite vix punctato, elytris striis antice oblitteratis versus apicem valde distinctis, interstitiis biseriatis obsolete punctulatis; subtus cum antennis pedibusque rufo-testaceis. Long. .08.

One specimen from Kansas. Also of the same form as the preceding.

5. *O. rubens*, ovalis convexus, ferrugineus nitidus, capite fere lævi, elytris

striae duabus solis internis tenuibus distinctis, obsoletissime seriatim punctatis, pectore obscuriore, antennis pedibusque testaceis. Long. .09.

One specimen, Georgia, which by its more regularly oval form differs from all the rest of this division.

B. Metasternum haud productum; (elytra stria suturali profunda.)

6. *O. obtusus*, breviter ovalis, convexus, niger nitidus, subtus cum pedibus rufo-piceus, antennarum clava fusca. Long. .07.

One specimen, San Jose, California. Resembles *Phalacrus* in its form, but the palpi and tarsi are those of this genus. The prosternum is ciliate with long hairs behind, which projecting over the mesosternum cause the latter to appear sulcate.

7. *O. apicalis*, oblongo-ovatus convexus, supra nigro-piceus, ore, thorace ad latera, elytrisque ad latera et postice indeterminate piceo-testaceis; subtus, pedibus antennisque testaceis. Long. .07.—.09.

Lec. Agassiz' Lake Superior, 222.

Phalacrus apicalis Mels. Proc. Acad. Nat. Sc. 2, 102.

Middle and Southern States and Lake Superior. Varies considerably in size and depth of coloring.

8. *O. aquatilis*, subovalis convexus, supra testaceo-piceus, medio obscuriore, subtus cum antennis pedibusque testaceus. Long. .08.

San Jose, California, near water. More regularly oval than *O. apicalis*, and narrower than *O. obtusus*.

9. *O. nitidus*, rotundatus subovatus convexus, rufo-testaceus nitidus, elytris laevibus stria suturali (sicut in precedentibus) impunctata. Long. .04.

Phalacrus nitidus Mels. Proc. Acad. Nat. Sc. 2, 102.

Middle and Southern States, common.

10. *O. pusillus*, supra nigro-piceus, ad latera indeterminate rufo-piceus oblongo-ovatus convexus, nitidus, elytris stria suturali antice punctata, punctisque seriebus duabus vel tribus utrinque abbreviatis parum distinctis, subtus cum antennis pedibusque testaceus pectore obscuriore. Long. .04.

Middle and Southern States. Narrower than *O. nitidus*, and very easily distinguished by the two or three rows of punctures reaching near the base or tip.

LITOCHRUS Er.

Palpi maxillares articulo ultimo cylindrico; tibiae tenues, calcaribus apicalibus conspicuis; tarsi postici reliquis longiores, articulo primo elongato; femora haud ciliata.

L. pulchellus, oblongo-ovatus convexus, supra piceus nitidus, thoracis elytrorumque lateribus, macula obliqua antica alteraque posteriore maxima, ore antennis pedibus, corporeque subtus late rufo-testaceis, elytris striae internae duabus tenuibus postice confluentibus. Long. .06.

(One specimen from Louisiana, liberally given me by Mr. Guex. A very beautiful little species. The elytra have only two very fine internal striae, which unite about one fourth from the apex. The anterior spot is oblique, the posterior one is larger and rounded.

Litochrus brunnipennis, Mann. Bull. Mosc. 1852, 369; from Sitha is according to a specimen sent me by Baron Chaudoir, a species of *Agathidium*.

Phalacrus pallipes, Say, Journ. Acad. Nat. Sc. 4, 90, from Kansas is unknown to me. It is a species of *Olibrus*, of the first division; it is described as not quite one tenth of an inch long, black, with the antennae, feet and palpi testaceous.

Note on the genus LITHODUS Schonherr.

By JOHN L. LE CONTRA, M. D.

On examining a considerable number of specimens of this curious genus, procured by me several years ago, in the valley of the Platte River, it became evident at once that several species existed; from the close resemblance in color, form and sculpture, it seemed to be a matter of difficulty to separate them, and I proposed to leave them until time and inclination would induce some entomologist to labor upon a monograph of our native Curculionidæ; such time being, however, apparently remote, and desiring to make use of the names of these objects in other investigations, I have thought it desirable to make them known.

The species are all of a dull black color without lustre, and covered, when alive, with a crust of dirty brown matter; the surface is thinly clothed with very short yellowish bristles, which proceed from punctures; the punctures of the head are small, and the front is deeply sulcate: the rostrum is shorter than the head, flat, slightly narrowed in front, with the mandibles distinct. The thorax is longer than wide, uneven, very coarsely punctured, rounded on the sides and narrowed somewhat rapidly in front, (except in *L. longior*); the disc has four vague impressions, and sometimes a slight dorsal channel: the part near the apex is transversely elevated, but more so in some species than in others; the sides are transversely impressed near the apex.

The elytra are convex, connate, declivous and somewhat pointed behind, emarginate at base, with the humeral angles variously prolonged and embracing the base of the thorax: they have rows of large irregular foveæ, and the interstices are alternately more elevated: between the foveæ may be seen a few elevated punctures. The legs are feeble, the tarsi are not dilated, and the pectoral excavation does not reach the anterior coxæ.

1. *L. humeralis*, thorace fortius inæquali, ad apicem fortiter transversim elevato; elytris humeris valde productis, ad thoracis tertiam partem extendentibus, extrorsum curvatis. Long. .33.

Germ. in Schönherr, *Curc.* 2, 420; 6, 2, 390.

Brachycerus humeralis Say, *Journ. Acad. Nat. Sc.* 5, 254.

Thecesternus humeralis Say, *Curc.* 8.

The humeral angles are much longer than in any of the others, and very distinctly bent outwards.

2. *L. rectus*, thorace fortius inæquali, ad apicem fortiter transversim elevato; elytris humeris valde productis, ad thoracis quartam partem extendentibus porrectis. Long. .35.

One specimen. The thorax is as strongly impressed, and as much elevated at the base as in the preceding, but the humeral angles are less prolonged, and not curved outwards.

3. *L. affinis*, thorace minus inæquali, ad apicem modice transversim elevato, in latera minus profunde impresso; elytris humeris breviter recte productis. Long. .35.

Differs from the next by the less strongly impressed and less deeply punctured thorax.

4. *L. rudis*, thorace valde cribroso, inæquali, ad apicem magis transversim elevato, in latera fortius impresso, elytris (sæpe tomento variegatis) humeris breviter recte productis. Long. .31.—.35.

The thorax is more strongly and densely punctured than in the others, and the small elevations between the impressed foveæ of the elytra are usually more distinct.

5. *L. erosus*, thorace minus inæquali ad apicem paulo transversim elevato, in latera minus profunde impresso; elytris humeris breviter recte productis. Long. .25.

Resembles *L. affinis*, but is only one third the size; the impressions of the elytra are also more irregularly distributed, and their sides are more rounded.

6. *L. longior*, magis elongatus, thorace inæquali, in latera fortius impresso elytris humeris paulo productis. Long. .23.

Narrower than any of the others: thorax one third longer than wide, very gradually narrowed at base and tip, with the four dorsal impressions, and the lateral ones well marked. Elytra only moderately emarginate at base, with the humeri only slightly produced, and somewhat acute.

7. *L. morbillosus*, thorace inæquali, in latera minus profunde impresso, ad apicem transversim paulo elevato, elytris humeris parum productis. Long. .25.—.3.

Resembles in form and characters *L. affinis* and *L. erosus*; it is intermediate in size, but the humeral angles are less prolonged, being, in fact, but slightly produced, and subacute.

These species occur under dried buffalo excrement in the desert region along the valleys of the Platte and Arkansas river: and are sometimes very abundant.

Notice of three genera of SCARABÆIDÆ found in the United States.

By JOHN L. LE CONTE, M. D.

On account of the great resemblance in appearance between species of different genera among several of the tribes of Scarabæidæ, much confusion has resulted from the effort to place our species properly. This has perhaps been particularly the case with our smaller Dynastidæ. Eight species were placed by me in the genus *Bothynus*, and the species known to Burmeister were placed by that author in *Podalgus* and *Heteronychus*. A more careful examination convinced him that the reference to the former of these two genera was incorrect, and peculiarities in the stridulating organs required the construction of a new genus, *Ligyris* Burm. (Lamell. 3, 542.) Although *Heteronychus relictus* is not mentioned, it also belongs to this genus, which comprises all the species from the United States known to Burmeister, except his *Podalgus obesus* (*Bothynus castaneus* Mels.)

The genus *Ligyris* possesses a small elliptical plate of stridulating surface on the inner surface of the elytra, near the outer and posterior margin; the mandibles are strongly dentate externally, and the outer lobe of the maxillæ are toothed at the tip.

In the third volume of Prof. Lacordaire's admirable work on the genera of Coleoptera, these genera are carefully divided into groups, with the characters subordinated; and in one of the valuable notes he indicates the existence of a genus not recognized by Burmeister, and distinguished by having no organs of stridulation. No name was suggested, as the scope of Lacordaire's book permitted the introduction of no new materials; but, as I find myself under the necessity of referring to the species in some catalogues now preparing for publication, I have been obliged again to review those referred by me to *Bothynus*, and now present the results, with the addition of two other remarkable genera.

LIGYRUS Burm.

As the inner surface of the elytra cannot always be conveniently examined, the following characters may be used to recognize the species of this genus. The mandibles are strongly toothed externally; the clypeus is only narrowly margined, furnished usually with two small upright teeth at the apex; the front is always transversely carinated, but the carina does not reach the sides of the head. The species may be divided into two groups, and the first may again be subdivided according as the clypeus has one or two apical teeth.

1. Thorax with an anterior fovea and acute tubercle; anterior tibiae tridentate.

A. Clypeus bidentate at tip.

1. *L. morio*, oblongus, postice paulo latior, subtus ferrugineus, supra piceus vel ferrugineus, capite transversim æqualiter carinato, thorace parce punctato, lateribus subangulatis, elytris punctato-striatis, pygidio vix punctato; (maxillarum galea bidentata.) Long. '53—'6.

Bothynus morio Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 87.

Middle States, not rare. Differs from the next by the less deep punctures of the elytra, by the less dense and less coarse punctures of the thorax, and the more distinctly angulated sides of the latter, and by the pygidium being hardly punctured. The body is also more elongated and less dilated posteriorly.

2. *L. gibbosus*, oblongus, postice latior, subtus ferrugineus, supra piceus vel ferrugineus, capite transversim carinato, rugoso opaco, thorace parce fortius punctato, lateribus vix angulatis, elytris sæpiissime fortius punctato-striatis, pygidio parce punctato; (maxillarum galea bidentata.) Long. '48—'67.

Scarabæus gibbosus De Geer, 4, 322; tab. 19, fig. 7.

Podalgus variolosus Burm. Lamell. 3, 121.

Lygus variolosus Burm. Lamell. 3, 542.

Var. Elytras minus protunde punctato-striatis, seriebus internis fere oblitteratis.

Bothynus obsoletus Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 87.

Our most common species; found from Massachusetts to Texas, and westwardly to Santa Fe, Colorado River and Oregon. The specimens from California, Oregon and Texas differ in having the sides of the thorax more regularly rounded, and in the Californian and Oregon specimens the inner striae of the elytra are frequently almost obliterated, and the thorax scarcely foveate. From the locality there can be no doubt that this is De Geer's species, with the description of which it corresponds. The differences between this and the preceding have been already mentioned; from the next it differs (apart from the maxillæ) by the less deep punctures of the elytra, and by the rugosely punctured and almost opaque clypeus.

3. *L. juvenicus*, ferrugineus, supra et subtus concolor, postice dilatatus, capite transversim carinato, antice fere lævi, thorace grossius minus dense punctato, lateribus rotundatis, elytris fortiter punctato-striatis, pygidio parcius punctato; (maxillarum galea tridentata.) Long. '53—'6.

? *Lygus juvenicus* Burm. Lamell. 3, 542.

? *Podalgus juvenicus* Burm. ibid. 3, 121.

? *Geotrupes juvenicus* Fabr. Ent. Syst. emend. 1, 32; Syst. El. 1, 20.

? *Scarabæus juvenicus* Oliv. Ent. 3, 45, tab. 8, fig. 66, and tab. 16, fig. 143.

Bothynus neglectus Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 87.

Georgia and South Carolina, common. The description of the clypeus "finely wrinkled, bidentate, the frontal suture elevated, abbreviated at the sides, slightly emarginate in the middle," given by Burmeister, leaves a doubt in my mind whether our species are really identical. The clypeus in mine is nearly smooth, and the frontal carina is in no respect different from that of the two preceding species. The references to Fabricius and Olivier are acknowledged by Burmeister to be doubtful, and it must be a matter of regret that the name was not allowed to become obsolete.

B. Clypeus at tip, with only a single elevated tooth.

4. *L. ruginatus*, ferrugineus, supra et subtus concolor, postice paulo latior capite rugose punctato, ad apicem acumine unico mucronato, transversim leviter carinato, thorace minus dense punctato, lateribus rotundatis fovea antica rugosa, elytris regulariter sat fortiter punctato-striatis, pygidio vix punctulato, (maxillarum galea tridentata.) Long. '65.

One specimen found at Ringgold Barracks, Texas, by Lieut. Haldeman. In form and sculpture of the head and thorax this species exactly resembles *L.*

gibbosus, but the apical tooth of the clypeus is central, and therefore is not produced by wearing from a bidentate form; the transverse carina is less elevated. On the elytra the rows of punctures are somewhat more regular and smaller than in the specimens from the Atlantic States. The fovea behind the anterior acute tubercle of the thorax is rounded and densely rugose, while in all the species of division A it is polished. The maxillæ are distinctly visible in the specimen, and their galea is obviously tridentate at tip. The form of the stridulating organs and the sculpture of the propygidium is precisely as in the other species.

2. Thorax without anterior fovea and acute tubercle; anterior tibiae sub-4-dentate.

5. *L. relictus*, nigro-piceus oblongus, capite leviter rugose punctato, clypeo antice bidentato, transversim carinato, carina medio interrupta, thorace parce punctato, lateribus rotundato, elytris lineæ suturali, alterisque 8 punctatis per paria approximatis, interstitiis alternis punctis plus minusve confusis notatis, pygidio parce punctato, ad basin subtiliter rugoso. Long. 7—9.

Scaphæus relictus Say, Journ. Acad. Nat. Sc. 5, 194.

Heteronychus relictus Burm. Lamell. 3, 92.

Bothynus relictus Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 87.

Middle and Southern States, and Kansas as far as the Rocky Mountains; those from the latter locality are smaller than those found in Pennsylvania. Slight differences are observed in form in this species; females occur usually of a regular oblong form like the males, but occasionally they are quite considerably ovate.

In the other species of the genus I have been able to detect no sexual differences; here, however, the inner claw of the anterior tarsi of the male is thickened, dilated and suddenly curved.

L. rugiceps, oblongus, nigro-piceus, capite valde rugose punctato, clypeo antice bidentato, transversim carinato, carina medio interrupta, thorace parce punctato, lateribus rotundatis, elytris punctis densioribus sicut in priore insculptis. Long. 55.

Two specimens without any abdomen, from Georgia. Very closely resembles the preceding in form and sculpture, but the size is so different that I cannot consider them as the same species. The only specific differences I can find, however, are the more strongly rugose head and more densely punctured elytra.

APHONUS Lec.

This genus contains species agreeing with *Ligyris* in every respect, except that the elytra on the inner surface are not furnished with stridulating plates, and the mandibles are not dentate externally; to avoid, however, the necessity of raising the elytra, recourse may be had to the structure of the head, which is narrowly margined, hardly transversely carinate just before the eyes, but at most furnished with a slight tubercle; the tip of the clypeus is varied in form; in the first division the tip itself is elevated, and immediately behind it is a sharp transverse elevated line, which is either uniform or tridentate. In the second division the tip is rounded, and the elevated line is strongly bidentate.

The species of the first division are of a very short ovate convex form; the mandibles are not prominent, the antennæ are 10-jointed, the 6th and 7th joints wider than the preceding ones; the one forming the second division is, however, only moderately dilated behind, the mandibles are more prominent, and the fifth and sixth joints of the antennæ are of the same size and closely united.

I. Thorax not foveate near the apex.

A. Pygidium moderately convex; last abdominal segment hardly finely margined.

1. *A. pyriformis*, breviter ovatus, obscure ferrugineus, capite confertim rugoso, vertice medio obsolete tuberculato, fronte ad apicem truncata, mox, one

apicem alte et paulo concave transversim reflexa, thorace lateribus rotundatis, punctato, parcius in disco pone medium, elytris sat grosse punctato-striatis, pygidio punctulato, parcius ad apicem. Long. .67.

Bothynus pyriformis Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 88.

Found near the forks of the Platte River. I observed in the collection of Capt. Wilkes' Exploring Expedition a specimen from Oregon, that I referred to this species, but as I have not now an opportunity of re-examining it, I cannot answer for the correctness of the reference. The sides of the head are extremely narrowly margined.

B. Pygidium very convex, last abdominal segment with a very strong line near the margin.

2. *A. tridentatus*, ovatus, piceus, subtus obscure ferrugineus, capite dense rugoso tenuiter marginato, fronte ad apicem emarginata et medio submucronata, mox pone apicem alte transversim reflexo tridentato, thorace lateribus rotundatis, punctato, parcius in disco pone medium, elytris grosse punctato-striatis, pygidio subtilissime punctulato, abdominis segmento ventrali ultimo linea marginali insculpto. Long. .64.

Scarabæus tridentatus Say, Journ. Acad. Nat. Sc. 3, 209.

Bothynus tridentatus Lec. Journ. Acad. Nat. Sc. 2d ser. 1, 88.

One specimen found by me near Long's Peak; another from Missouri was given me by Prof. Agassiz. Both are females, and have the marginal line of the last abdominal segment sinuate at the middle.

3. *A. frater*, nigro-piceus, subtus nigro-ferrugineus, capite rugoso tenuiter marginato, in vertice obsolete elevato, clypeo ad apicem emarginato et mucronato, mox pone apicem linea transversa elevata tridentata, thorace lateribus rotundatis, punctato, parcius in disco pone medium, elytris rarius punctato-striatis, pygidio punctulato, versus apicem parce punctato, abdominis segmento ultimo ventrali linea marginali insculpto. Long. .65.

One male found in New Jersey, given me by Mr. Guex. Differs from *A. tridentatus* only by the pygidium being nearly smooth at the tip, with a few distinct punctures, and by the punctures of the elytra being smaller and the striae less numerous; this is produced by the absence of the rows between the alternate striae; these intermediate rows are usually known by being slightly irregular. From the next species it differs by this character, as well as by the color and shape.

4. *A. hydropicus*, breviter ovatus, ferrugineus, capite rugoso fortius marginato, in vertice obsolete elevato, clypeo ad apicem emarginato et mucronato, mox pone apicem linea transversa elevata tridentata, thorace lateribus rotundatis, punctato, parcius in disco pone medium, elytris fortiter punctato-striatis, pygidio parce subtiliter punctato, ad basin dense punctulato, abdominis segmento ultimo ventrali linea marginali insculpto. Long. .57.

Bothynus variolosus Lec. Journ. Acad. Nat. Sc. 2d. ser. 1, 88.

Georgia, not rare. Much more dilated behind than the two preceding, with the punctures of the elytra large and the rows numerous. The pygidium of the female is much more convex than that of the male, and the submarginal line of the last ventral segment is sinuous in the middle, while in the male it is uniformly curved.

5. *A. castaneus*, breviter ovatus, ferrugineus, capite rugoso fortius marginato, vertice vix elevato, clypeo ad apicem emarginato et acute mucronato, mox pone apicem linea transversa elevata tridentata (dente medio minore,) thorace parcius punctato, elytris fortiter punctato-striatis, pygidio parce subtiliter punctato, ad basin punctulato, abdominis segmento ultimo ventrali linea submarginali insculpto. Long. .45.

Bothynus castaneus Mels. Proc. Acad. Nat. Sc. 2, 138.

Podalgus oberus Burm. Lamell. 3, 119.

Middle and Southern States. Of the same form as the preceding, but only one-third the size, with the thorax less punctured, and the alternate striae of the elytra arranged in pairs and composed of smaller punctures than in *A. hydropticus*. The sexual differences are as in *H. hydropticus*.

II. Thorax at the apex submucronate and slightly foveate.

6. *A. clunialis*, oblongus, convexus, piceo-castaneus, postice parum dilatatus, capite dense rugose punctato, tenuissime marginato, clypeo ad apicem rotundato submucronato, mox pone apicem linea valde elevata bidentata armato, sutura frontali distincta emarginata, medio tuberculo parvo notata, thorace lateribus valde rotundatis, subtilius punctato, disco versus basin sublevi, ante apicem fovea parva punctata notato, et in apicem brevissime mucronato, elytris punctato-striatis, punctis externis minoribus confusis, propygidio subtilius punctato, ad apicem levi, pygidio levigato modice convexo; abdominis segmentis singulo serie transversa grosse punctato, ultimo tenuiter marginato, (maxillarum galea bidentata.) Long. .95.

One specimen found by Dr. Thos. H. Webb, of the Boundary Commission, and probably in the valley of the Gila. This species differs so much from the other species of the genus, that it can hardly be associated with them; I have, however, failed to discover any better place for it, and do not desire at present to increase the number of genera. Although the propygidium is somewhat rough with punctures, I do not perceive any transverse rugæ, such as indicate the organs of stridulation in other genera. The hind tibiae are thicker than usual, and the transverse crest at the middle is prolonged externally into an acute tooth; it does not, however, agree with any of the genera of *Pimelopides* described by Lacordaire, and seems rather to belong to the division *Pentodontides*.

POLYMERUS Lec.

Clypeus trilobatus, lobis rotundatis, margine fortiter reflexo, ad apicem dentibus duobus parvis erectis armato, fronte utrinque transversim carinata, carinis margine adnexis; oculi valde inclisi; mandibulæ extrorsum haud dentatæ, ad apicem acutæ et sursum productæ; palpi articulo ultimo subcylindrico; (maxillæ haud visæ;) antennæ 10-articulatæ, clava triphylla, feminae reliqua parte paulo, maris æquali longiore; in hoc sexu articulis funiculi externis crassioribus compressis. Prosternum pone coxas haud prominulum. Pedes breves, crassi, tibiæ femoribus haud longiores, anticæ ultra medium tridentatæ, dentibus appressimatis; intermedia et posticæ ultra medium extrorsum emarginatæ et unicoloratæ; ad apicem vix ciliatæ, angulo externo paulo producto; tarsi tibiis haud longiores, articulis 1—4 æqualibus parce setosis, posteriores articulo imo haud elevato, 4to vero subtus longe acuminato; 5to omnium longiore, unguiculis anticis sexus utriusque simplicibus, posterioribus feminae simplicibus, maris externis ad medium fortiter dentatis, dente ungue ipso vix brevior. Podex biarticulatus nudus.

A very remarkable genus of regularly oblong oval form, and not furnished with stridulating organs. Its characters approach those of *Pachylus*, from which, however, it is quite distinct. Professor Lacordaire, to whom I sent a specimen submitted it to a careful examination, and from his letter I translate the following extract, convinced that the opinion of my most learned friend, who has examined nearly all the genera of this family, will be of more service to the student than any thing I could say: "The *Lamellicorn* which you have sent is very remarkable, but there can be no doubt regarding its place in the entomological series. It is a genuine *Dynastide*, as is proved by the last abdominal stigmata diverging strongly, and by the form of the mentum, the mandibles and the clypeus; but it is related to the *Melolonthides* by the form of the head, the eyes, the antennæ and the tarsi. Its facies is at once that of certain species of both groups. In short, it is a completely new form, intermediate between the two groups mentioned, and you can without fear found upon it a new genus,

which ought, in my opinion, be placed among the Cyclocephalides, along side of *Pachylus*, which is also a very anomalous genus.

P. brevipes, nigro-piceus, vel obscure castaneus, oblongus, convexus, capite rugose punctato, clypeo ad apicem bidentato, fronte utrinque transversim carinata, margine reflexo, thorace lateribus rotundatis, confertim punctato, parce autem in disco pone medium, elytris punctato-striatis, punctis versus suturam confusis, pedice punctato; abdomine coxisque posticis confertim aciculatis. Long. .63—.7.

Pennsylvania, New York and Missouri; rare. Larger, more convex and more regularly oblong than *Ligyris variolosus*. The outer striae of punctures are almost entirely regular, while those next the suture are confused, especially towards the base. The eyes of the male are larger and more prominent than those of the female.

PLEOCOMA Lec.

Clypeus (labrum?) prolongatus, antice angustatus acute rotundatus, pone apicem cornu transverso erecto furcato armatus; caput ante oculos acute extrorsum angulatum, vertice inter oculos cornu brevi erecto armatum; oculi magni vix emarginati. Antennae 11-articulatae, articulo 2do sequentibus crassiores; 3io paulo elongato, 4 et 5to aequalibus, 6to paulo dilatato; 7mo adhuc duplo latiore, 8—11 lamellatis, valde elongatis aequalibus. Mandibulae, maxillaeque haud visae, palpi tenues. Thorax latus antrosum angustatus parum convexus, disco antice declivi subdeplanato. Elytra parum convexa postice late rotundata. Prosternum haud prominulum. Tibiae anticae elongatae 7-dentatae, dentibus supernis tribus minutis, 4 mediocri, 5—7 magnis; posteriores elongatae parum incrassatae, extrorsum ultra medium emarginatae et ad medium unidentatae, ad apicem oblique truncatae, ciliatae, angulo externo parum producto; tarsi (intermedii) tenues, tibia longiores, articulis 1—4 aequalibus, 5to praecedente duplo longiore, unguibus simplicibus, paranychia angusta bisetosa. Corpus subtus, os pedes elytraque ad marginem longe fulvo-pilosa.

A very remarkable insect, apparently belonging to the Dynastidae, but differing from all the described genera of that tribe by the 11-jointed antennae having a four-jointed club; the 7th joint might almost be considered as belonging to the club, but is only half the length of the four following. The very long hairs fringing the body give a strong resemblance in appearance to *Syrichthus*. The anterior tibiae are somewhat as in *Athyreus ferrugineus* and other *Geotrupides*, but the teeth are more unequal; the anteocular lateral horns are seen also in that species; the eyes are very large, and contract the mouth so much beneath that the maxillae and mandibles are invisible, or have been destroyed by insects; the thick hair also prevents me from seeing the form of the mentum. The form of the prosternum is the same as in *Athyreus*; the anterior femora are very densely clothed with hair on the anterior surface. The anterior and posterior tarsi and abdomen are unfortunately destroyed; the middle tarsi are exactly as in *Athyreus*. Doubt must therefore be entertained whether this genus should be placed with the Dynastidae or *Geotrupidae*; the form of the antennae is equally repugnant to each, while the irregular puncturing of the elytra finds no parallel in the latter tribe.

I find it impossible to determine whether the projecting part of the head beyond the anterior horn is a clypeus or labrum; there is a slight appearance of a suture, but I am not certain of its existence; the part in question is longer than wide, gradually narrowed in front and acutely narrowed at tip.

P. fimbriata, latiuscula, ovalis parum convexa, nigra nitida supra glabra, capite inter cornua excavato laevi, occipite subtiliter rugose punctato, thorace latitudine fere triplo breviora antrosum valde angustato, lateribus rotundatis parce punctulato, antice modice declivi, elytris stria suturali, alterisque 8 per paria approximatis parum distinctis punctatis, interstitiis sat dense punctatis, margine et subtus dense et longe fulvo-villosa. Long. 1.05.

A specimen found in California by Dr. A. H. Heermann was given by him to

Prof. Haldeman, and by the latter most liberally placed in my collection. It is, unfortunately, in a very bad state of preservation, but the remarkable characters will enable it to be readily identified when it again occurs. Mr. Motschulsky informed me, when in this country, that he had seen at the Imperial Museum of St. Petersburg, specimens of the same insect, which had been collected in California. He regarded it as allied to *Ceratophyus Fischer*, (a division of *Geotrupes*).

Analytical table of the species of CHLÆNIUS found in the United States.

By JOHN L. LE CONTE, M. D.

The close relationship existing between several of our species of *Chlænus*, and the fact that many species have been described under more than one name, induces me to believe that an analytical table by which the species, which are really distinct, may be readily recognized, will be of service to the students of the entomology of the United States. They may be thus arranged:

A. Caput punctatum; antennis articulo 3io longiore; pedes rufo-testacei.

A. Thorax convexus, grosse punctatus, subcordatus.

- | | |
|--|--------------------------------|
| 45. supra cyaneus, elytris macula magna apicali flavo. | 1. <i>C. posticus</i> Lec. |
| 46. supra violaceus, elytris nigris, | 2. <i>C. viridifrons</i> Esch. |
| 58. supra totus viridis | 3. <i>C. patruelis</i> Lec. |

B. Thorax planiusculus, æqualiter dense punctatus:

a. supra bicolors;

thorax postice subangustatus;

- | | |
|---|-------------------------------|
| 6—7, supra æneus, elytris atris, labro truncato | 4. <i>C. æstivus</i> Say. |
| 3, supra æneus, elytris atris, labro emarginato | 5. <i>C. pusillus</i> Say. |
| thorax postice non angustatus; | |
| 5—6, supra æneus, elytris atris, labro emarginato | 6. <i>C. emarginatus</i> Say. |
| 4, supra viridis, elytris paulo obscurioribus, labro emarginato | 7. <i>C. amœnus</i> Dej. |

b. supra cyanei, concolores;

- | | |
|--|-------------------------------|
| 77—85, magnus, thorace lateribus sinuatis | 8. <i>C. rufilabris</i> Dej. |
| 45, magnus, thorace lateribus non sinuatis | 9. <i>C. erythropus</i> Germ. |
| 55,—65, mediocris, elytris valde punctulatis | 10. <i>C. laticollis</i> Say. |

mediocres, elytris obsolete punctulatis;

- | | |
|---------------------------------------|------------------------------|
| 65, thorace lateribus subsinuatis | 11. <i>C. regularis</i> Lec. |
| 6—65, thorace lateribus haud sinuatis | 12. <i>C. rufipes</i> Dej. |

c. supra virides, concolores;

- | | |
|--|----------------------------------|
| 35, ovalis, thorace antrorsum valde angustato, angulis posticis obtusis, | 13. <i>C. lithophilus</i> Say. |
| 7, thorace antrorsum valde angustato, angulis posticis rectis | 14. <i>C. angustus</i> Newm. |
| 55, thorace antrorsum subangustato, basi impresso | 15. <i>C. sericeus</i> Say. |
| 75, thorace postice haud angustato, ano rufo | 16. <i>C. smaragdinus</i> Chaud. |

C. Thorax planiusculus inæqualiter punctatus, subcordatus;

- | | |
|--|------------------------------|
| 6—7, viridis, thorace subtiliter versus basin dense punctulato | 17. <i>C. prasinus</i> Dej. |
| 8, cyaneus, thorace vage minus subtiliter punctato | 18. <i>C. cumatilis</i> Lec. |

B. Caput læve, vel subtilissime punctulatum.

D. Thorax inæqualiter punctatus, cordatus; antennis articulo 3io longiore.

- | | |
|-------------------------------|---------------------------------|
| 80, cyaneus, thorace depresso | 19. <i>C. leucoscelis</i> Chev. |
|-------------------------------|---------------------------------|

- 6, obscure viridis, thorace depresso, elytris subtilius punctulatis 20. *C. chlorophaneus Dej.*
- (·66, "niger, elytris nigro-virescentibus" 21. *C. cordicollis Kirby.*
- 53, læte viridis, thorace convexiore, elytris valde punctatis 22. *C. solitarius Say.*
- E. Antennæ articulo 3io haud longiore: (thorax præcipue æqualiter punctatus.)*
 - a. supra bicolores, thorax æqualiter punctatus;
 - 47, thorace æneo obsolete punctato, elytris atris 23. *C. nemoralis Say.*
 - thorace fortius punctato;
 - 4—47, viridis, elytris vix obscurioribus, fortius punctulatis, striis vix punctatis 24. *C. pensylvanicus Say.*
 - 42—5, cupreo-æneus, thorace antrorsum fortius angustato, elytris atro-cyaneis, obsolete punctulatis, striis punctatis 25. *C. tricolor Dej.*
 - 45, viridis, thorace antrorsum parum angustato, elytris atro-cyaneis, obsolete punctulatis, striis fortiter punctatis 26. *C. brevilabris Lec.*
 - 45, viridis, elytris paulo obscurioribus, subtiliter punctulatis, tenuiter striatis 27. *C. Nebraskensis Lec.*
 - 44—54, thorace vage punctato, viridis, elytris obscurioribus 28. *C. glaucus Lec.*
 - b. supra concolores, thorace ante basin latiore;
 - 46, cyaneus, thorace æqualiter obsolete punctato, postice haud angustato, 29. *C. vafer Lec. Proc. 6, 66*
 - 43, æneo-ater, thorace inæqualiter punctato, transverso, postice angustato, elytris fortius punctulatis, (pedibus vel rufis vel nigris) 30. *C. asperulus Men.*
 - 37, æneo-ater, cyanescens thorace inæqualiter fere obsolete punctato, haud transverso, postice angustato, elytris minus conspicue punctulatis (pedibus rufis) 31. *C. obsoleteus Lec.*
 - 45, viridis, thorace inæqualiter fortius punctato, lateribus rotundato, 32. *C. circumcinctus Say.*
 - 5, totus æneo-ater, thorace quadrato, rugose, ad basin utrinque densius punctato, elytris fortius punctulatis 33. *C. harpalinus Esch.*
 - 55—65, ovalis, obscure æneus, thorace antrorsum angustato, dense subtiliter punctato, capite viridi 34. *C. impunctifrons Say.*
 - 5, ovalis totus niger, thorace antrorsum angustato, grosse inæqualiter punctato, profunde impresso, elytris valde punctulatis 35. *C. niger Randall.*
 - c. pedes et corpus concoloria, thorace ad basin latiore;
 - 37, fere ellipticus, supra cyanescens, thorace inæqualiter punctato, elytris subtiliter striatis densissime punctulatis 36. *C. purpuricollis Rand.*
 - fere elliptici fusco-ænei, thorace æqualiter fortius punctato, callo elongato utrinque discoidali notato, elytrorum striis antice grosse punctatis.
 - 55, thorace lateribus parum rotundatis 37. *C. tomentosus Dej.*
 - 67, thorace lateribus antice valde rotundatis 38. *C. amplus Lec.*

Doubtful species.

C. impunctifrons || Kirby, Fauna Bor. Am. 4, 21. Perhaps *C. brevilabris*, but the description is very indefinite.

C. quadricollis Kirby, Fauna Bor. Am. 4, 22. Probably *C. pensylvanicus*.

C. fulgiceps Newm. Ent. Mag. 5, 490. Probably *C. pensylvanicus*.

C. oxygonus Chaud. and *C. longicollis* Chaud. Bull. Mosc. 1843. Probably varieties of *C. tricolor* or *C. brevilabris*.

Dinodes rotundicollis Dej. Probably not North American.

The species in parentheses are unknown to me: the characters above given of them are taken from the original descriptions.

Notes and Synonyms.

1. *C. posticus* Lec. Mels. Cat. 13. is *C. apicalis*|| Lec. Ann. Lyc. of Nat. Hist. 5, 179.

4. *C. aestivus* Say, Trans. Am. Phil. Soc. 2, 62; *C. cobaltinus* Dej. Sp. Gen. 2, 331; var. *C. congener* Lec. Proc. Acad. 2, 51; Ann. Lyc. 4, 435.

5. *C. pusillus* Say, Trans. Am. Phil. Soc. 2, 63; *C. elegantulus* Dej. Sp. Gen. 2, 367.

9. *C. erythropus* Germ. Sp. Nov. 11; *C. rufilabris* Dej. Sp. Gen. 2, 329.

12. *C. rufipes* seems to vary much in the form of the thorax; the variety or race with the thorax short, more rounded on the sides, and the posterior angles obtuse is *C. brevicollis* Lec. Ann. Lyc. 4, 432. Many entomologists are disposed to receive it as a different species, but similar variations seem to occur in *C. sericeus*.

13. *C. lithophilus* Say, Trans. Am. Phil. Soc. 2, 62; *C. viridanus* Dej. Sp. Gen. 5, 660.

14. *C. angustus* Newm. Ent. Mag. 5, 490; *C. Lecontei* Hald. Proc. Acad. 1. 304.

15. *C. sericeus* Say, Trans. Am. Phil. Soc. 2, 61; Dej. Sp. Gen. 2, 347. *Carabus sericeus* Forster, Cent. Ins. 58, varies somewhat in the form of the thorax; a specimen in which the sides are more rounded than usual, and the anterior angles are considerably deflexed, is *C. perrividis* Lec. Ann. Lyc. 4, 434. This species is found from Maine to Oregon, and as far south as Texas.

19. *C. leucoscelis* Chev. Col. Mex. 1st cent.; *C. monachus* Lec. Ann. Lyc. 5, 180.

23. *C. nemoralis* Say, Trans. Am. Phil. Soc. 2, 65. It is doubtful whether the species described under this name by Kirby, (Fauna Bor. Am. 22) is really this; the expression 'thorax densely punctured' seems to indicate that *C. tricolor* is meant.

24. *C. pensylvanicus* Say, Trans. Am. Phil. Soc. 2, 66. *C. pubescens* Harris, New England Farmer, 1828; *C. ricinus* Dej. Sp. Gen. 5, 659. This species varies slightly in the form of the thorax, but may be easily distinguished from the allied species, by the rough and distinctly punctured interstices of the elytra, while the striae are only faintly punctured. *C. fulgiceps* Newm. and *C. quadricollis* Kirby, are perhaps to be added to the synonyms of this, but the descriptions are very unsatisfactory. Mannerheim states that this species is found in California, but I have not seen any specimens from the regions west of the Rocky Mountains.

25. *C. tricolor* Dej. Sp. Gen. 2, 334. Specimens of this species were found by me at Tucson, in Northern Sonora, and at San Diego, California; they differ from those found on the Atlantic slope of the continent, by the thorax being shorter and more rounded on the sides.

26. *C. brevilabris* Lec. Ann. Lyc. Soc. 4, 437. Differs from *C. tricolor*

by the thorax being broader and less narrowed anteriorly, and by the striæ of the elytra being very strongly punctured; *C. consimilis* Lec. appears to be merely a variety in which the head and thorax are slightly coppery, and the latter is not narrowed toward the base.

27. *C. Nebraskaensis*, subtus niger, supra viridi-æneus, pubescens, capite subtilissime punctulato, thorace latitudine brevior, haud convexo, lateribus rotundatis utrinque paulo angustato, sat dense punctato, ad basin utrinque longe impresso, angulis posticis obtusis; elytris obscurioribus striis tenuibus antice subtilius punctatis, interstitiis planissimis subtiliter punctulatis, pedibus palpisque rufis, antennis piceis articulis tribus baseos rufis, 3io sequente haud longiore. Long. .45.

Yellowstone River, Dr. Hayden: Santa Fe, Mr. R. C. Kern. Differs from the neighboring species by the more finely striate elytra; in a dorsal view in fact the outer striæ appear almost obliterated.

28. *C. glaucus*, subtus niger, supra obscure viridi-æneus, pubescens, capite subtilissime punctulato, thorace latitudine paulo brevior, subquadrato, utrinque subangustato, lateribus modice rotundatis, vagus et profunde punctato, ad basin utrinque longe impresso, angulis posticis subrectis, elytris obscuris, vel atrocyanis, striis punctatis, interstitiis fere planis, subtiliter punctulatis, pedibus palpisque rufis, antennis piceis, articulis tribus baseos rufis, 3io haud longiore. Long. .44—.54.

Colorado river, near the junction of the Gila. Larger than the neighboring species, and known by the more quadrate thorax, being less densely punctured.

30. *C. asperulus* Ménétries, Bull. Soc. Imp. St. Petersb. 2, 55. Baron Chaudoir informs me that *C. obscurus* Lec. Ann. Lyc. 5, 179, belongs to this species. The color varies, so that the head sometimes becomes greenish bronzed, as described by Ménétries. The antennæ are sometimes entirely black, and sometimes the first joint is reddish brown. The feet vary in color from rufous to black. The thorax is slightly narrowed, both at the apex and base, but cannot be called cordate. The thorax is described by Ménétries "cordato, profunde sed vage punctato," and I should not venture to refer his to my species, were it not for the direct comparison made by my learned and accurate correspondent, Baron Chaudoir. This discrepancy in the description leads me to believe that *C. variabilipes* Esch. must also be referred here: it being premised that not only does the color of the legs and antennæ vary, but even the punctures of the thorax, are sometimes very strong, (though never dense, as described by Eschscholtz), and the fine punctures of the interstices of the elytra are at times less distinct.

The description of Eschscholtz (Zool. Alas 5, 27), is as follows:—

"Niger pubescens, capite lævi, thorace subviolaceo, punctatissimo, basi coarctato; angulis productis; elytris obsolete punctulatis, striis profunde punctatis, antennarum basi pedibusque aut rufo-testaceis aut nigris. Long. $3\frac{1}{2}$ lin.

"San Francisco. Head black, almost imperceptibly rugous. Thorax wider than long, somewhat rounded on the sides, narrowed near the rectangular prominent posterior angles; disc dark blue, thickly covered with large but not deep punctures, hairy with brown pubescence, with two longitudinal impressions at the base. Scutellum black, smooth, shining. Elytra clothed with brown hair, opaque black, very finely and not obviously punctured; humeri not prominent; striæ fine, and strongly punctured on the anterior half. Antennæ and legs of one specimen black, palpi with the last joint red, cylindrical: in the other specimen, a female, the two basal joints of the antennæ, the whole of the palpi, and the feet are red: the third joint of the antennæ is of the same length as the following."

The description of Ménétries reads thus:—

"*C. asperulus*, obscure æneus, rufo-pubescens; capite lævi, viridi-cupreo, thorace cordato, profunde sed vage punctato; elytris striatis, striis forte punctatis, interstitiis subtilissime asperatis; antennis pedibusque nitide nigris, palpis rufis."

31. *C. obsoletus*, *Lec. Ann. Lyc.* 5, 180, is certainly closely allied to the preceding, but the thorax is hardly wider than long, and is more narrowed behind; the feet, palpi and antennæ are rufous, the latter being darker externally as is usual.

32. *C. circumcinctus* Say, *Trans. Am. Phil. Soc.* 4, 418; *C. virens* Chaud. *Bull. Mosc.* 1843.

34. *C. impunctifrons* Say, *Trans. Am. Phil. Soc.* 2, 64; *C. emarginatus* Kirby, *Fauna Bor. Am.* 4, 23.

35. *C. niger* Randall, *Bost. Journ. Nat. Hist.* 2, 34; *C. exaratus* Férè, *Ann. Ent. Soc. Fr.* 2nd ser. 9, 249.

37. *C. tomentosus* Dej. *Sp. Gen.* 2, 357; *Epomis tomentosus* Say, *Trans. Am. Phil. Soc.* 2, 60; *Amara luctuosa* Germ. *Sp. Nov.* 10. On this species M. La Férè has founded a genus *Eurydactylus*, which differs from *Chlænus*, only in the dilated joints of the anterior tarsi of the male being broader. I do not find in this character an exact agreement between our different species, and, although I have adopted the genus in my memoir in the *Trans. Am. Phil. Soc.* (10, 390,) I now unite in the opinion of Lacordaire, *Gen. Col.* (1, 224) that it is entirely unnecessary. Say mentions a green variety from Missouri.

38. *C. amplius*. I have separated under this name a species having the color and sculpture of *C. tomentosus*, but very different in the form of the thorax, which instead of being gradually rounded on the sides from the base to the apex, has the sides almost parallel near the base, and very much rounded before the middle. It is found in Georgia, and I have examined two specimens of which one is in the collection of Dr. Harris.

Synopsis of Species of CHRYSOMELA and allied Genera inhabiting the United States.

By W. FREDERICK ROGERS.

The Genera in the United States may be thus classified:—

Ungues fissi; femora postica incrassata;

Blepharida.

Ungues integri, vel vix dentati; femora haud incrassata;

Doryphora.

Palpi articulo ultimo brevius truncato

(Polygramma, Labidomera).

Palpi articulo ultimo haud brevius;

Tarsi articulo 2do haud angustiore

Timarcha.

Tarsi articulo 2do minore

Chrysomela.

BLEPHARIDA.

Maxillary palpi with the last joint cylindrical and obtusely pointed at the extremity. Posterior femora moderately thickened. Middle and posterior tibiae with an obtuse angle on the exterior margin one-third from the tip. Ungues bidentate. Anterior coxae moderately distant. Prosternum flat. Mesosternum hardly protuberant. Middle coxae widely separated.

B. rhois. Oval, convex, ferruginous; head and thorax yellow; elytra with eleven rows of large punctures, irregularly mottled sometimes vittate with yellow and ferruginous; margin always broadly yellow; antennae black, base piceous. Length .25—30.

Chrysomela rhois Forst. *Cent. Ins.* 1, 21. *Hüb. Naturf.* 24, St. 40. *Oliv. Enc. Meth.* 5, 720.

Altica virginica Frolsch, *Naturf.* 26, 129, 54.

Haltica rhois Illig. *Mag.* 8, 161.

Chrysomela stolida Fabr. *Ent. Syst.* 1, 318. *Syst. El.* 1, 435. *Oliv. Enc. Meth.* 5, 720.

Haltica stolida Illig. *Mag.* 8, 161.

Chrysomela meticulosa Oliv. *Ins.* 91, 531, tab. 6, fig. 91.

Locality.—Middle States, Southern States, Nebraska and Upper Mississippi. There is considerable variation in the marking; one specimen from the Southern States was observed having the disc of the elytra irregularly ferruginous with a broad yellow margin. Another specimen from the South has the elytra ferruginous and the spaces between the suture and 1st, 2 to 3, 5 to 6 and 8 to 9th striae yellow.

These differences are sufficient to account for the supposed species above quoted.

DORYPHORA Fabr.

Ungues entire, posterior femora not thickened. Maxillary palpi thickened; penultimate joint conical, last joint cylindrical, truncate shorter than the preceding; tibiae rounded at the extremity and excavated externally; tarsi with second joint small. Coxæ widely separated.

The genus may be divided into three divisions:—

1. Tropical species, in which the mesosternum is produced into a horn.
2. Those in which the mesosternum is slightly excavated, and the feet without spines. Sp. 1—4.
3. Those in which the mesosternum is slightly protuberant, and the anterior femora are armed with spines, at least in the male. Sp. 5.

1. *D. juncta*. Oval, convex, brownish yellow, head and thorax spotted with black; elytra pale yellow, each with 9 rows of punctures and four black vittæ; scutellum black; suture and space between the two outer vittæ and epipleuræ brownish yellow; lateral margin blackish, beneath spotted with black; femora with a small black spot.

Length .35—.40.

Chrysomela juncta Germ. Sp. Nov. 590.

Locality.—Georgia.

The two outer vittæ are usually connected at the base and tip, but occasionally are completely confluent.

2. *D. 10-lineata*. Oval, convex, brownish yellow, head and thorax spotted with black, scutellum brownish yellow, margined with black, elytra each with five black lines; the interior line is confluent with the suture behind, beneath spotted with black; knees and tarsi black.

Length .35.

Say, J. Acad. 3, 453.

Locality.—Nebraska and Texas.

3. *D. rubiginosa*. Oval, convex, yellowish brown, scutellum black; elytra finely not densely punctured; antennæ and legs black.

Length .40.

One specimen collected by J. D. Clark, Esq., of the Mexican Boundary Commission at San Antonio, Texas.

Body above and below yellowish brown; head with a few punctures, a finely impressed vertical line, and a few small impressions between the eyes; thorax with a few scattered punctures, larger and more obvious at the sides, elytra finely punctured; the punctures in some places forming irregular rows.

4. *D. Haldemani*. Subovate, convex, purplish black; elytra dark metallic green, sparsely punctured.

Length .35.

One specimen collected by Lt. H. Haldeman, Fredericksburg, Texas.

Body subovate, narrowed in front very convex, almost gibbous; head and thorax sparsely punctured, purplish black, scutellum black, elytra sparsely punctured, the punctures becoming smaller towards the tip, and occasionally arranged in rows; antennæ, legs and under surface purplish black.

5. *D. trimaculata*. Oval, rounded convex, bluish green; elytra orange with blue band and large posterior spot; feet purplish.

Length .30—.40.

Say, J. Acad. 3, 455. Harris, Ins. 2nd edit. 117.

Chrysomela trimaculata Linn. Syst. Nat. 2, 592. Fabr. Ent. Syst. 312. Fabr. El. 1, 424. Oliv. Ins. 91, 515, pl. 3, fig. 29. Coquet. Ill. 3, 123.

Chrysomela clivicollis Kirby, Fann. Bor. Amer. 213.

Locality.—Middle States, Southern States and Nebraska.

Antennæ and palpi black; elytra punctured in double lines, which become confused near the tip; a dilated black band extending in breadth from near the base to the middle, not attaining the lateral edge, and often interrupted in the middle of each elytron; under surface black, feet purplish.

TIMARCHA Redt.

Palpi slightly thickened with the last joint, oval, truncate and a little longer than the preceding; tarsi with the second joint not smaller than the first or third; unguis simple approximate; coxæ of anterior feet moderately, of the posterior widely separated; tibiae rounded at the extremity, not sulcate. Body oblong, very convex, black scabrous, with confluent impressed punctures, which are coarsest upon the elytra; the latter are united.

T. intricata. Head irregularly and strongly punctured, thorax with large scattered punctures, the interstices tolerably densely punctured, transverse, more than twice as long as broad; apex broadly emarginate, base subsinuate, basal angles rectangular; elytra with large confluent punctures, the interstices with fine scattered punctures; under surface coarsely, feet finely punctured. Tab. 1, fig. 1.

Length .40.

Hald. Proc. Acad. 6, 363.

T. intertexta Hald. Ibid.

Locality.—Oregon and northern California, Dr. Townsend and Mr. Child.

T. intertexta I regard as a variety of *intricata*, with the elytra a little more rugose.

CHYSOMELA Linn.

Palpi with the last joint not longer than the preceding; tarsi with second joint smaller than the first and third; unguis simple; coxæ of anterior feet moderately or slightly, those of the posterior widely separated. The body varies in form from rounded to oval, and even to elongate; it is usually winged, but apterous in only one American species; the palpi vary in form, having the last joint in many thick and dilated, and in others slender; thorax always broader than long, sometimes equally convex, sometimes with the lateral margin broadly thickened. The sculpture of the elytra varies; some are very finely and confusedly punctured with labyrinthine rows of larger punctures limiting spots of different colors, while in others the punctures are arranged in nine regular striae with a short one at the scutellum. The mesosternum is never protuberant, the femora are never toothed. The tibiae vary in form; they are sometimes rounded at the tip and not sulcate; sometimes dilated into an angle; and sometimes sulcate on the outer margin.

The species found in this country may be divided into the following groups:—

I. Palpi dilated;

1. Sides of the thorax not thickened.

- * Tibiæ rounded at the apex, elytra irregularly punctured, or with sinuous striae.

Elytra with labyrinthine spots.

A.

Elytra striped.

B.

- ** Tibiæ with an external tooth near the apex; elytra with regular striae of punctures.

C.

2. Sides of the thorax thickened.

D.

II. Palpi slender.

1. Body elongate.
 - * Elytra irregularly punctured. E.
 - Sides of the thorax thickened. F.
 - Sides of the thorax not thickened. G.
 - ** Elytra with regular striæ of punctures.
2. Body rounded
 - *** Elytra with regular striæ of punctures. H.
 - **** Elytra irregularly punctured.
 - Tibiæ excavated externally and dilated at tip. I.
 - Tibiæ excavated externally, hardly dilated at tip. K.

Group K, does not appear in the subsequent pages, as I have seen no American specimens of *C. adonidis*, the species on which it is founded; although Kirby states that specimens of it were obtained in high northern latitudes.

A.

1. *C. scalaris*. Oval, greenish blue, elytra punctate, yellowish white spotted with blue, suture with a broad metallic black stripe branched in three or four places, humerus with a large lunate spot; under surface bronzed black, antennæ and legs ferruginous. Tab. 1, fig. 2.

Length .32—.40.

Lec. Ann. Lyc. 1, 173. Harr. Ins. 117.

C. philadelphica Kirby, Faun. Bor. Am. 210.

Locality.—Middle States, Lake Superior and Nebraska.

Oval, rather narrower than usual, greenish blue, sometimes dark bronze; thorax with scattered punctures at the sides, elytra punctate, yellowish white, and very brilliant silvery when living; suture with a broad metallic stripe generally black, sometimes bronze and dark blue. This insect is closely allied to *C. philadelphica* of Linn., the difference consists in the suture being marked with a broad black stripe, with which the spots are connected so as to form branches; in *C. philadelphica* the suture is black, straight and narrow, separated from a narrow subsutural black vitta by a narrow yellow line. There is considerable variety in the color and size of the spots of these insects.

2. *C. serpentina*. Oval, greenish blue, elytra pale gold, with the suture and several large sinuous dark blue spots more or less confluent; margin black, antennæ black, red towards the base; legs dark red, under surface bluish black. Tab. 1, fig. 3.

Length. .42.

Five specimens collected by J. D. Clark, Esq., at San Antonio, Texas.

Body oval, moderately convex; head with a triangular impression between the eyes, thorax coarsely punctured at the sides, scutellum bluish green, elytra pale gold, suture and confluent stripe blue, the latter not reaching the base, with about ten dark blue spots, wings brilliant red; under surface very dark blue, almost black; antennæ hairy at the tip.

I have adopted the name used in Dr. Le Conte's Cabinet. In dried specimens the golden tint of the elytra fades, and the color becomes yellowish white.

3. *C. dislocata*. Oval, bluish green, elytra pale ferruginous, with subsutural vitta and several sinuous black spots more or less confluent, antennæ blackish, red at the base, legs and under surface black. Tab. 1, fig. 4.

Length. .35.

Three specimens collected by J. D. Clark, Esq., San Antonio, Texas.

Body oval, moderately convex, head moderately punctured; thorax strongly punctured at the sides.

4. *C. tortuosa*. Oval, ferruginous; elytra yellow with several black spots, suture and a subsutural vitta dark ferruginous, the latter confluent near the tip, antennæ, legs and under surface ferruginous. Tab. 1, fig. 5.

Length. .25.

Two specimens collected by J. D. Clark, Esq., San Antonio, Texas.

Head and thorax ferruginous slightly punctured, scutellum ferruginous, elytra with from five to nine black spots, sometimes confluent, legs slightly punctured.

5. *C. philadelphica*. Oval, greenish black, elytra pale yellow, with a longitudinal stripe near the suture, and a number of dark green spots; palpi, antennæ and legs rufous, under surface dark green. Tab. 1, fig. 6.

Length. .27—.34.

Linn. Syst. Nat. 2, 592, 44. De Geer. Ins. 5, 353, 6, t. 16, f. 13. Fabr. Syst. El. 1, 444, 135. Fabr. Syst. Ent. 1, 392. Oliv. Ent. 5, 91, 525, 33, t. 2, f. 22.

C. decipiens Web. Obs. Ent. 1, 52, 1?

Locality.—Middle, Southern and Western States.

Body oval, with scattered punctures, head and thorax sparsely punctured; scutellum dark green, elytra with three larger dark spots near the suture; the suture is generally black, and dilated towards the thorax, but in one specimen from Missouri Territory, this is not the case, and in it the suture is pale yellow, and does not become broader in front.

C. spiræ. Green, elytra pale yellow tinged with red, with green spots and a common sutural line, trifid at base, antennæ and legs rufous; under surface dark green.

Length. .25.

Say, J. Acad. 5, 297.

C. confinis Kirby, Fauna Bor. Amer. 211.

Locality.—Lake Superior.

Body oval, head and thorax dark bronzed green, elytra pale yellow, sometimes rufous, each with about seventeen small green dots, and a common sutural line which sends off a lateral short branch on each side near the base. In one specimen the spots and sutural line are black.

7. *C. Bigsbyana*. Oval, green, anterior margin and sides of prothorax yellow, elytra yellow, with a sutural stripe, antennæ and legs rufous, under surface dark green.

Length. .25—.35.

Kirby, Fauna Bor. Amer. 212.

Locality.—Middle and Western States, also two specimens from Steilacoom, Puget sound, W. T., collected by Geo. Gibbs, Esq.

8. *C. multipunctata*. Oval, ferruginous, thorax yellow, with ferruginous spots arranged in a circle, elytra yellow, with numerous green spots; antennæ, legs and under surface ferruginous. Tab. 1, fig. 7.

Length. .24—.35.

Say, J. Acad. 3, 451. Kirby, Fauna Bor. Amer. 211.

Locality.—Missouri Territory.

Head ferruginous, thorax yellow, with a ferruginous, irregular arcuated line and basal edge, including an obsolete spot, elytra with a sutural stripe and numerous irregular green spots, and abbreviated lines. In one specimen the suture has a common ferruginous fillet.

B.

9. *C. exclamationis*. Oval, ferruginous, thorax with a yellow margin, elytra pale yellow, with four black striz, the third abbreviated, the fourth interrupted.

Length. .30.

Fabr. El. 1, 435. Oliv. Ins. 91, 530. tab. 6, fig. 81.

Locality.—Southern States and Kansas.

Head ferruginous, anterior margin of the prothorax yellow, elytra pale yellow, with the suture and four striz ferruginous; the first and second not reaching the margin, the third confluent with the fourth at the edge of the elytra; legs and under surface ferruginous.

10. *C. casta*. Oval, dark ferruginous; thorax strongly but sparsely punctured; elytra pale yellow, sparsely punctured; suture and three lines marked

with fine punctures; legs and under surface ferruginous; epipleuræ brown. Tab. 1, fig. 8.

Locality.—Kansas and Illinois; specimens from the latter locality were collected by Mr. R. Kennicott.

This insect is allied to *C. pulchra*, but in that species the outer vittæ are usually entirely confluent into one broad stripe. In *C. casta* these lines are narrow and the subsutural one is confluent only behind the middle.

11. *C. coniuncta*. Oval, convex, ferruginous; thorax yellow, sparsely punctured with a large ferruginous spot covering the base; elytra pale yellow, with the suture and subsutural vitta confluent; the other two connected behind and a short one at the humerus, legs and under surface ferruginous. Tab. 1, fig. 9.

Length. .23.

Locality.—Kansas.

Related to *C. exclamtionis*, but is smaller, with head and thorax more shining and less punctured; with the conjoined vittæ more abbreviated behind there is no lateral dot at the middle, and the epipleuræ are not ferruginous, except at the extreme margin.

12. *C. disrupta*. Round and convex, blackish; thorax coarsely punctured, elytra pale yellow, punctured; the suture, sub-sutural vitta and three other discoidal narrow ones anteriorly abbreviated, with several sub-marginal bronzed dots; legs and under surface blackish. Tab. 1, fig. 10.

Length. .21—.26.

Locality.—Louisiana and Kansas.

This insect is of the same form as the previous ones, but may be distinguished by the interruption of the interior dorsal vittæ; the middle one nearly unites posteriorly with the inner one, but is a little shorter than it; the outer posterior dots are directly in continuation of the external abbreviated vitta: epipleuræ pale.

13. *C. hybrida*. Ferruginous, elytra pale yellow, with a wide sutural and discoidal ferruginous band, the band nearly divided into two, of which the inner one is narrower. Tab. 1, fig. 11.

Length. .35.

Say, J. Acad. 3, 449.

Locality.—Southern States and Nebraska.

Body oval, thorax irregularly punctured and with larger confluent punctures on the sides; scutellum impunctured, rounded at the tip; antennæ, legs and under surface ferruginous.

There is great variety in the marking, a specimen from Nebraska has the band divided into three, the first joined to the second at the base, the middle one sinuous and joined to the outer one at the tip, the outer one very faint, at the base.

14. *C. incisa*. Oval, rounded, bronzed, ferruginous; thorax with coarse punctures; elytra pale yellow, with a broad blackish brown sutural vitta abbreviated at the base, a broad stripe narrowed at the humerus and not reaching the base, and a small dot at the base, and another at the tip; epipleuræ dark. Tab. 1, fig. 12.

Length. .24.

Locality.—One specimen from Kansas.

This insect has the same form and size as *C. pulchra*, the punctures of the dark vitta and those of the external rows are, however, more distinct, and the form of the vittæ different. The sutural one is not prolonged at the base, but truncate anteriorly at the scutellum, which, as usual, is dark colored; at about two-thirds the length it is suddenly slightly dilated nearly to the apex. The outer vitta is a very broad spot extending three-fourths the length of the elytra; narrowed before and behind, convex on its inner, but moderately emarginate on its outer surface about the middle.

15. *C. pulchra*. Rounded, black bronzed; elytra pale yellow; suture and a broad dorsal vitta dark bronzed.

Length. .24—.26.

Fabr. El. 1, 425. Oliv. Enc. Méth. 5, 693. Fabr. Ent. Syst. 1, 313, 27. Coqueb. Ill. Ins. 3, 123. Sch. Syn. Ins. 2, 240.

Locality.—Middle and Southern States.

Body oval, rounded; thorax coarsely punctured; scutellum black, which gives the sutural vitta the appearance of extending to the prothorax; elytra pale yellow, with punctures on the suture and vitta which do not reach the apex or base, outer margin of the vitta slightly and obtusely sinuous; the vitta is sometimes partially divided by a yellow line, and may sometimes form two vitta; in another specimen the sutural and discoidal vitta are confluent; antennae, legs and under surface brownish black.

16. *C. similis*. Oval, dark bronzed; elytra pale yellow; suture and a broad dorsal vitta dark bronzed. Tab. 1. fig. 13.

Length. .26.

Locality.—Middle and Southern States.

This species differs from the preceding in the shape; it is quite oval, whereas, *C. pulchra* is round; the emargination of the outer margin near the middle is more angular and sudden.

17. *C. praeclis*. Oval, convex, ferruginous; thorax with a yellow margin; elytra pale yellow, with fine punctures; legs, thorax and under surface ferruginous. Tab. 1, fig. 14.

Length. .31.

Locality.—Kansas river.

Thorax with the disc coarsely punctured, with a narrow yellow margin at the side impunctured; elytra with fine punctures on the suture and dorsal vitta, with a broad sutural vitta suddenly narrowed at the base, and a broad bronze brown dorsal vitta, narrowed at the apex and base.

18. *C. elegans*. Oval, metallic black; thorax yellow, with a black mark at the base; elytra pale yellow, with a black suture and dorsal vitta.

Length. .20—.25.

Oliv. 91, 532, tab. 6, fig. 92.

Locality.—Middle and Southern States and Lake Superior.

Head black; antennae black, with the second and third joints slightly ferruginous; thorax yellow, slightly punctured, with two confluent spots on each side placed obliquely, the anterior one being nearer the middle; and with a black dorsal line; the spots have the appearance of the letter W inverted; elytra pale yellow, slightly punctured with a black sutural and dorsal vitta regularly punctured; legs and under surface black.

C.

19. *C. rufipes*. Oblong, oval, ferruginous; head black, with mouth and antennae red; thorax coarsely punctured with two large triangular spots at the base; elytra ferruginous, with ten black spots, legs red, under surface black.

Length. .25.

De Geer. Ins. 5, 295, tab. 8, fig. 5. Suffr. Linn. Ent. vol. 5, 211.

Phytodecta rufipes Kirby. Fauna Bor. Amer. 213.

Locality.—Lake Superior.

There is great variety in the marking of the thorax and elytra, the markings in some specimens are very faint, and in others wanting. I have not been able to make any comparison between this and the European species, and I give it as identical on the authority of Kirby.

20. *C. arctica*. Oblong, oval, elongate, ferruginous; head black; thorax with two basal black spots usually confluent, coarsely punctured; scutellum black; elytra ferruginous, with ten black spots; legs black, with the tibiae and tarsi red.

Length. .26.

Gonioctena arctica Mann. Bull. Mosc. 1853.

Gonioctena affinis† Mann. Bull. Mosc. 1852, 2, 369.

Locality.—Russian America.

According to Mannerheim's description, this species varies much in color; he also states that it is nearly allied to the European *G. nivosa*.

D.

21. *C. subsulcata*. Oblong, oval, apterous, dark blackish green; thorax with the margin much thickened, not reaching the apex internally, slightly punctured; elytra connate, very convex, rounded at the sides, sulcate and punctured in regular rows; antennæ, legs and under surface very dark bluish green.

Length. .32.

Mann. Bull. Mosc. 1853.

Locality.—Russian America.

22. *C. cribraria*. Oblong, oval, bronzed black; thorax much thickened at the sides, reaching the apex, with a few large marginal punctures near the impression; elytra very dark, bronzed black, thickly and irregularly punctured; antennæ, legs and under surface black.

Length. .37.

Locality.—Southern States.

23. *C. inornata*. Oblong oval, bronzed; thorax with margin thickened and a few coarse punctures at the side; elytra bronzed black; legs and under surface dark blue.

Length. .25.

Locality.—Western States.

This insect is closely allied to *C. cribraria*, but differs in the color of the thorax and elytra; there are also more punctures on the thorax, and the lateral impression is less deep than in *C. cribraria*.

24. *C. subopaca*. Oblong oval, black, bronze, tinged with green; thorax with thickened margin, with a few punctures at the sides; elytra finely punctured, with the punctures forming indistinct rows; antennæ dark blue, with the four last joints hairy, legs and under surface black, bronzed.

Length. .25.

Locality.—Middle States.

Thorax less punctured; elytra more finely punctured and less lustrous than in *C. inornata*; the punctures are arranged in rows.

25. *C. auripennis*. Oval, oblong, violaceous; thorax with the margin thickened and slightly distant punctures; scutellum violaceous; elytra golden cupreous brilliant, exterior edge green, punctured, punctures placed in somewhat regular rows; antennæ, legs and under surface violaceous.

Length. .32—46.

Say, J. Acad. 3, 452.

Locality.—Western States, Nebraska, New Mexico and Texas.

These insects vary greatly in color; two specimens from New Mexico are entirely violaceous, and in one from Texas the elytra are brilliant green.

26. *C. vidua*. Oblong, oval, black, slightly bronzed; thorax with the margin thickened, with coarse punctures; elytra black, slightly bronze, with the punctures in somewhat regular rows; antennæ, legs and under surface black.

Length. .26.

Locality.—Oregon, Col. McCall.

27. *C. flavomarginata*. Oblong, black; thorax with lateral margin thickened and punctured at the sides; elytra black, with regularly-disposed punctures, and smaller irregularly disposed punctures; exterior and tip yellowish, legs and under surface black.

Length. .22—29.

Say, J. Acad. 3, 452.

Locality.—Kansas.

E.

28. *C. interrupta*. Oblong, elongate, black; thorax black, with a yellow margin thickened; elytra pale yellow, with six spots on each more or less confluent; legs bluish black, with tibiae ferruginous.

Length. 25—35.

Fabr. El. 1, 438. Oliv. Ins. 91, 558, tab. 8, fig. 119.

Locality.—Middle States, Southern States, Lake Superior, Nebraska and Oregon.

This species varies much in color, the specimens I have examined may be classed under the following varieties, though intermediate forms occur:—

1. The two anterior spots confluent; two middle spots confluent; and the two posterior spots confluent, forming a very broad band; legs bluish black, with tibiae ferruginous; under surface bluish black.

2. The two anterior spots confluent, having the shape of a horse shoe; the two middle spots separate and the two posterior confluent, but much more narrow than in 1.

3. With none of the spots confluent; legs bluish black; tibiae pale yellow, under surface black, with the four last segments of the abdomen slightly marked with yellow.

4. In which all the spots have disappeared, with the exception of the two middle ones; legs blue, black, with the tibiae ferruginous, under surface black.

5. The two anterior spots confluent; the middle separate, and the posterior confluent; legs and under surface ferruginous, except the sides of the pectus, which are black.

6. None of the spots confluent; legs ferruginous; under surface of the thorax black.

29. *C. scripta*. Oblong, elongate, black; thorax black, with a yellow margin thickened; elytra yellow, coarsely and sparsely punctured, with seven elongate spots on each elytron, two at the apex, slightly elongate, three at the middle very elongate; and two at the base, the one nearest the suture slightly elongate, the other broad and very elongate.

Length. 27—35.

Fabr. El. 1, 438. Oliv. 5, 559. Oliv. Enc. Méth. 5, 119?

Locality.—Middle States, Southern States, Nebraska and Lake Superior.

In two specimens the thorax is dark red, with a yellow margin, and the under surface black with the legs ferruginous.

30. *C. confluent*. Oblong oval, black, head and thorax black, thorax with a wide yellow margin, elytra brownish black, finely and sparsely punctured, with four very faint oblong ferruginous spots on each elytron, antennae, legs and under surface black.

Length 28.

Locality.—Oregon, one specimen.

Closely allied to *C. obsoleta* of Say, but differs from it in the form of the body, being wider in proportion, also in having the elytra more finely punctured.

31. *C. obsoleta*. Oblong oval, head and thorax tinged with green, margin of the latter yellowish, thickened, with a black insulated point; elytra brownish black irregularly punctured, margin, tip and obsolete lines before and behind the middle yellowish, antennae legs and under surface black.

Length 33.

Helodes obsoleta Say, J. Acad. 3, 435.

Locality.—Western States.

Differs from *C. confluent* in the form of the body, being longer and more narrow, also in having the elytra more coarsely and densely punctured.

F.

32. *C. californica*. Oblong oval, dark green, thorax sparsely punctured,

elytra dark green, coarsely punctured, antennæ and legs black, under surface blackish green.

Length .18.

This insect was sent by Col. Motschulsky, under the name of *Plagiodera californica*, as coming from California, but I have been unable to find any description of it.

G.

33. *C. trivittata*. Oblong, blue-black, head entirely blue-black, with an impressed frontal line divaricated before; thorax sparsely punctured, lateral margins yellowish, this color being contracted in the middle on the inner side; elytra with punctured striæ, sutural margin yellow; vitta on the middle not reaching the tip, and exterior edge blue-black; legs black, tibia ferruginous, abdomen with the caudal segment margined behind with dull yellow.

Length .15.

Helodes trivittata Say, J. Acad. 5, 289.

Locality.—Middle States, Lake Superior.

34. *C. vitellinæ*. Oblong slightly oval, coppery violaceous, antennæ with first and second joint rufous; thorax finely and sparsely punctured, elytra coppery violaceous, punctured in rows with the interstices indistinctly punctured; under surface bronze black, legs black with the first joint of tarsi rufous.

Length .16—.18.

Phytodecta vitellinæ Kirby, Faun. Bor. Amer. 216.

Locality.—Middle States, Western States and Lake Superior.

One specimen from Lake Superior had the elytra black.

H.

35. *C. viride*. Rounded, dark green, head with an impressed frontal line, thorax very finely and sparsely punctured; scutellum blackish, elytra very finely punctured in striæ with the lines remote, antennæ, legs and under surface blackish.

Length .12—.16.

Gastrophysa viride Mels. Pro. Acad. 3, 175.

Locality.—Middle States.

I.

36. *C. dissimilis*. Oblong oval, metallic blue or green, head impressed between the antennæ, antennæ black, thorax regularly convex, lateral edges regularly curved, scutellum impunctured, elytra densely punctured, legs and under surface black, posterior angles of thorax very obtuse and rounded.

Length .24.

Say, J. Acad. 3, 451.

Locality.—Nebraska.

Varies in its colors. It is sometimes of a very dark purple, and sometimes of a bright green, more or less tinged with violaceous, particularly about the suture.

37. *C. caesia*. Oblong oval, brilliant metallic green, head and thorax densely punctured with the posterior angles of the thorax obtuse, elytra metallic green, finely punctured, legs and under surface blackish green.

Length .21—.23.

Locality.—California, at San Francisco.

The thorax is very perceptibly narrower than the elytra; and the body is longer and more convex than *C. cyanea*.

One specimen is blackish.

38. *C. cyanea*. Oblong oval, purplish, head and thorax densely punctured, elytra purplish, densely punctured, antennæ legs and under surface purplish black.

Gastrophysa cyanea Mels. Pr. Acad. 3, 175.



1



2



3



4



5



6



7



8



9



10



11



12



13



14

Length .20.

Locality.—Middle and Southern States.

This insect is very closely allied to *C. caesia*, but differs in having the thorax wider, and the body longer and more narrow in proportion to its size.

39. *C. polygoni*. Oblong oval, brilliant metallic blue, head blue-black punctured, antennæ black, basal joint rufous beneath and at tip, thorax rufous sparsely and finely punctured, elytra brilliant metallic blue densely punctured, under surface blackish blue, legs rufous, tarsi black, anus rufous.

Length .18.

Linn. Fn. Suec. 520; Syst. Nat. 2, 589, 24. Harris, Insects, 118, (2d edition.)

C. ceruleipennis Say, J. Acad. 5, 296.

Phædon polygoni Kirby, Fn. Bor. Am. 216.

Locality.—Southern and Middle States.

40. *C. formosa*. Oblong oval, convex, above golden green, strongly punctured, thorax with the basal angles obtuse, scutellum purple, elytra strongly punctured, suture purplish, exterior edge blue, antennæ and palpi black, tibiae black, under surface violaceous.

Length .18.

Say, J. Acad. 3, 451.

Locality.—Kansas and Santa Fé.

List of Species unknown to me.

C. viminalis Linné. Mann. Bull. Mosc. 1853. Russian America.

C. lapponica Linné. Mann. Bull. Mosc. 1853. Russian America.

Phratora interstitialis Mann. Bull. Mosc. 1853.

C. basilaris Say, J. Acad. 3, 451.

C. adonidis Fabr. El. 1. 431. *Phædon adonidis* Kirby, F. B. A. 216.

Gastrophysa ænea Mels. Pr. Acad. 3, 175.

Gastrophysa raphani Fabr. Kirby, F. B. A. 216.

All the specimens, I have described in the preceding pages, are in the Cabinet of Dr. J. L. Le Conte, to whom I must return my sincere thanks for his valuable assistance and the kind loan of books and specimens.

Notes on North American Birds in the Collection of the Academy of Natural Sciences, Philadelphia, and National Museum, Washington.

By JOHN CASSIN.

1. *Buteo montanus*, Nuttall, Man. Orn. U. S. i, p. 112, (1840).

"*Buteo Swainsonii*, Bonap.," Cassin, B. of Cal. and Tex. i, p. 98.

"*Falco buteo*, Linn." Aud. Orn. Biog. iv, p. 508. Aud. B. of Am. pl. 372, Oct. ed. i, pl. 6.

On examination of not less than twenty specimens of this bird from various localities in the Western countries of North America, I have found the characters constantly present which distinguish it from *Buteo borealis*, as pointed out in my Birds of California and Texas, p. 98. The voice of this species is represented by several of the late naturalists who have visited California, as quite peculiar, and I am assured by my friend Dr. Thos. M. Brewer, of Boston, that the egg is entirely different from that of *B. borealis*. Though nearly related to that species, it is very probably entitled to be regarded as distinct, for which purpose Mr. Nuttall's name as above given is proper.

This bird appears to be of common occurrence in California, being brought in nearly every collection from that country, and it is also in Dr. Suckley's collection from Washington Territory. The specimen figured by Mr. Audubon as above, and which was brought by Dr. Townsend from the Rocky Mountains, is in the collection of the Philadelphia Academy. It is the same specimen described by Mr. Nuttall, and named as above.

2. *SPIZELLA PALLIDA*, (Swainson).

Emberiza pallida, Swainson, Faun. Bor. Am., ii, p. 251 (1831).

Emberiza Shattuckii, Audubon, B. of Am., oct. ed. vii, p. 347 (1844). Aud. B. of Am. oct. ed. vii, pl. 493.

The bird described and figured by Mr. Audubon as above, is the *Emberiza pallida*, Swainson, as any one may readily determine by examining and comparing the descriptions as above cited, with or without specimens.

This species is easily recognized by its wide stripe of ashy white from the base of the bill over the eye, two longitudinal stripes on the head of brownish black, and with an intermediate or middle stripe on the top of the head ashy white. Ears and cheeks behind and below the eye pale brown, with a line of black on its lower edge, and another line of black from the corner of the lower mandible. Upper parts of body pale ashy brown, every feather on the back and wing coverts with a black longitudinal stripe; tail brown. Under parts white, tinged with ashy and pale brown on the sides and flanks. Bill and feet yellowish. Total length $5\frac{1}{2}$ inches, wing $2\frac{1}{2}$, tail $2\frac{1}{2}$ inches.

Hab. Western North America, California. Spec. in Mus. Acad. Philada., and Nat. Mus. Washington.

3. *SPIZELLA BREWERI*, nobis.

"*Emberiza pallida*, Swains." Audubon, Orn. Biog. v, p. 66. Aud. B. of Am. pl. 398. oct. ed. iii, pl. 161.

This species has the head above and other upper parts uniform pale ashy brown, every feather having a narrow brownish black line, a short and obscure stripe of ashy white over the eye. No stripes on the head, as in the preceding. Under parts ashy white. Bill and feet yellowish. Total length 5 inches, wing $2\frac{1}{2}$, tail $2\frac{1}{2}$ inches.

Hab. Western North America, California, New Mexico. Spec. in Mus. Acad. Philada., and Nat. Mus. Washington.

Easily distinguished from the preceding by the absence of the stripes on the head, so strongly characterizing that species and smaller size. It is apparently a much more abundant species, being brought in nearly all collections from California and New Mexico.

I have much pleasure in embracing the present opportunity to dedicate a bird of the United States to my esteemed friend Thomas M. Brewer, M. D., of Boston, one who to the highest abilities and social qualities adds an ardor in devotion to Ornithological science rarely paralleled.

4. *TOTANUS BREVIPES*, Vieill. Nouv. Dict. vi, p. 410 (1816).

Totanus fuliginosus, Gould, Voy. Beagle, Birds p. 130 (1841).

Scolopax undulata, Forster, Desc. An. p. 173 (1844).

Totanus polynesiæ, Peale, Voy. Vincennes and Peacock, Birds p. 237 (1848).

Totanus pulverulentus, Müller, Verh. p. 153 (1844)?

Totanus oceanicus, Lesson, Comp. aux Œuv. de Buffon. p. 244 (1847).

Tringa glareola, Pallas, Zoog. Ross. As. ii, p. 194 (1831).

Pallas Zoog. Rosso-As. Birds, pl. 60. Temm. and Schl. Fauna Japon. Birds, pl. 65?

About the size of or rather larger than *T. flavipes*. Wing long, pointed, first primary longest, secondaries short, truncate, emarginate, tertiaries long, tarsi and toes rather short, tibia feathered about two-thirds of its length.

Adult.—Entire upper parts, neck, breast and sides dark lead colored, uniform and without white marks; throat, middle of abdomen, ventral region and under tail coverts white. Under wing coverts white, spotted and barred with dark lead color. A stripe of white from the base of the bill over the eye, lores brownish black, eye enclosed in a narrow circle of white. Quills dark brown, shaft of the first primary white on its upper surface; shafts of the other primaries reddish brown on their upper surface, and of all on their under surfaces, white. Tail lead colored, uniform with the upper parts of the body, shafts of tail feathers lead colored above, white beneath. Bill dark, feet greenish.

Younger.—Upper parts as above, entire under parts transversely barred with

dark ashy brown and white, the former predominating on the sides and flanks. Throat and middle of the abdomen white.

Dimensions.—Total length (of skin) about 10½ inches, wing 6½ inches, tail 3½ inches.

Hab. Islands in the Pacific Ocean, Washington Territory, (Dr. J. G. Cooper) Spec. in Nat. Mus. Washington, and Mus. Acad. Philada.

For the first time within the limits of the United States, this extensively diffused species has been found in Washington Territory, the extreme north west portion of this Republic, by J. G. Cooper, M. D., naturalist attached to the party which surveyed the most northern proposed route for a rail-road to the Pacific Ocean, and commanded by Hon. I. I. Stevens. It is a small species uniformly colored above, and not difficult to distinguish from any other of its genus yet discovered in the United States.

This species possesses an extensive range of locality, probably including the greater part of the entire western coast of North and South America, the Sandwich and Feejee Islands, and is very nearly allied to, if not identical with the Japanese species, figured as above in Fauna Japonica. It has, moreover, quite a redundancy of names, a portion of which we cite above. Pallas gives this species as an inhabitant of Kamtschatka and the Russian American islands.

5. *ANAS HYSSOBORUS*, Pallas, Spicilegia Zoologica, i, pt. vi, p. 25, (1769.)

Anas nivalis, Forster, Phil. Trans. London, lxii, p. 413, (1772.)

Wilson, Am. Orn. viii, pl. 68, fig. 5. Aud. B. of Am. pl. 381, fig. 1, oct. ed. vi, pl. 381, fig. 1.

This species is either liable to great variation in size and color of plumage, or three distinct birds have been confounded under one name. My present information inclines me to the opinion that the latter is the truth; after having collected numerous specimens now in the Museum of the Academy, and rather carefully noted the observations of northern voyagers and of naturalists attached to Arctic Expeditions.

Two distinct sizes appear to be constant in the same sexes of specimens that are perfectly white, with the black tips of the primaries and the ferruginous markings on the head and face in both, and these I regard at present as distinct species. The larger is the bird described by Pallas and Forster and by all American authors as the Snow Goose, and is much the more frequent on the Atlantic coast of North America. It is figured by the authors above cited and by others, and specimens are frequently brought to the markets of the cities, though some winters have passed in Philadelphia in which I have not noticed it. Specimens of adults and young are in the Museum of this Academy, the young being distinguished by the prevalence of a cinereous color on the upper parts of the head, neck and body. Sexes alike, female slightly smaller.

Dimensions.—Male. Total length (of skin) about 31 inches, wing 18½, tail 6½. bill from the tip to frontal feathers along the culmen 2½, to gape 2½, tarsus 3½ inches.

6. *ANAS ALBATUS*, nobis.

Form.—Smaller than the preceding, bill shorter, bare space at the base of the upper mandible not extending so far into the feathers (on the sides of the bill in front.) Wing long, second quill longest, tail short but comparatively rather longer than in the preceding, which is also the case with the tarsus.

Dimensions.—Male. Total length (of skin) about 25 inches, wing 15½, tail 5½, bill measured along the culmen from tip to frontal feathers 2, to gape 2, tarsus 3 inches. Sexes alike, female slightly smaller.

Colors.—Adult. Entire plumage white, except primaries, which are pale cinereous at base and black in the terminating two-thirds of their length. Front and cheeks spotted with ferruginous, bill and feet red.

Hab.—Western and Northern America, Oregon, rare on the Atlantic.

A single specimen from Oregon is in the collection of the Exploring Expedition in the Vincennes and Peacock, and four specimens, which occurred in pairs, have come under my notice in the market at Philadelphia in the course of twenty years. These five specimens are all that I have seen of this species, and it is

very probably of rare occurrence on the coast of the Atlantic in this latitude, much more so than the preceding. The four specimens alluded to, which are a pair of adults and a pair of young, are now in the collection of the Philadelphia Academy.

The third species, confounded by authors with the preceding, is:

7. *ANSER CÆRULESCENS* (Linn.)

Anas cærulescens, Linn. Syst. Nat. i. p. 198, (1766.)

Edwards, Birds, iii. pl. 152. Wilson, Am. Orn. viii. pl. 69, fig. 5. Aud. B. of Am. pl. 381, fig. 2, oct. ed. vi. pl. 381, fig. 2.

This bird is figured and described by both Wilson and Audubon, as the young of *Anser hyperboreus*, but neither of them appear to me to have done so on any sufficient information, as may, I think, readily be inferred from their articles on that species. That it is not the young of either of the preceding species is my conclusion, being, as I believe, acquainted with the young of both.

The figure given by Edwards as above, represents, apparently, the young of this species, and those of Wilson and Audubon a more mature stage of plumage, if not adult. This bird was known to the earlier naturalists, having been named by Linnæus as above, in 1766, and before him by Brisson in 1760. Both, however, probably described on the faith of Edwards' figure, which was published in 1748. Pennant apparently does not, but gives a sufficient description of this species under the name of "Blue winged Goose" in Arctic Zoology, ii, p. 269, (1792.)

If this bird is the young of *Anser hyperboreus*, which I deem very improbable, its specific name as above is the proper designation of the species, having priority over Pallas' *Anser hyperboreus*, or Forster's *Anas nivalis* (Phil. Trans. London, lxii. p. 413, 1772,) which are synonymes. It is of rare occurrence on the coast of the Atlantic, in the latitude of New Jersey, though stated to be abundant in the Arctic regions. Specimens in the Museum of the Philadelphia Academy.

✓ A Synopsis of Entozoa and some of their Ecto-congeners observed by the Author.

✓ By JOSEPH LEIDY, M.D.

PROTHELMINTHA.

1. *BODO RANARUM* Ehrenberg.

Abundant in the intestines of different species of frogs and toads.

2. *BODO HELICIS* Diesing.

Cryptobia helcis Leidy, Proc. Acad. Nat. Sci., iii, 101.

Cryptoius helcis Leidy, Journ. Acad. Nat. Sci., 2d ser., i, 67.

Bodo helcis Diesing. Leidy, Pr. A. N. S., v, 284.

3. *BODO COLUBRORUM* Hammerschmidt.

In the cloaca of *Tropidonotus sirtalis*.

4. *BODO JULIDIS* Leidy.

Pr. A. N. S., v, 100; Trans. Am. Phil. Soc., 2d ser., x, 244.

5. *BODO MUSCARUM* Leidy.

Frequent in the intestine of the house fly, *Musca domestica*, in immense quantity.

6. *BODO MELOLONTHE* Leidy.

Body spherical; diameter .00449 to .0112 mm.

Tail simple, about the length of the diameter of the body.

Found in the intestine of *Melolontha quercina* and *M. brunnea*.

7. *BURSARIA INTESTINALIS* Ehrenb.

In the intestine of *Rana pipiens*.

8. *LEUCOPHRYS STREYATIS* Dujardin.

Leucophrys. Leidy, Journ. A. N. S., 2d ser., ii, 49.

In the liquids of the body of *Enchytraeus*.

9. *LEUCOPHRYX CLAVATA* Leidy.

Journ. A. N. S., 2d ser., ii, 50; iii, 144.

Found in the *Lumbriculus limorus*, and *L. tenuis*.

10. *LEUCOPHRYX COCHLEARIFORMIS* Leidy.

Journ. A. N. S., 2d ser., iii, 144.

Found in the intestine of *Lumbriculus tenuis*.

11. *LEUCOPHRYX SOCIALIS* Leidy. Cordate, ovate, oval, pyriform, or globular, contractile, active, with one or many internal vacuolæ; striated, ciliated. Length .036 to .045 mm., breadth .03 mm.

Found very frequently and abundantly within the stomach of the remarkable bryozoan *Urnatella gracilis*. (Pr. A. N. S., vii, 191.)

12. *NYCTOTHERUS VELOX* Leidy.

Pr. A. N. S., v, 233; Trans. Am. Phil. Soc., 2d ser., x, 244.

From the large intestine of *Julus marginatus*.

13. *NYCTOTHERUS OVALIS* Leidy.

Pr. A. N. S., v, 100; Trans. Am. Phil. Soc., 2d ser., x, 244.

From the intestine of the common cockroach, *Blatta orientalis*.

14. *ALBERTIA*? *PELLUCIDUS* Leidy.

Anelocidicus pellucidus Leidy, Pr. A. N. S., v, 287.

MYZELMINTHA.

15. ?*MONOSTOMUM INCOMMODUM* Leidy. Body compressed, above convex, below concave, sides parallel, anteriorly convex, posteriorly angularly convex. Head continuous with the body, obliquely truncated. Mouth round, surrounded with a wide circular lip which is emarginate below. Male generative aperture? communicating with a hemispherical cavity (acetabulum?) one fourth the length of the body from the head. Length 9 lines, breadth $1\frac{1}{2}$ lines.

Five specimens were obtained from the fauces of the *Alligator mississippiensis*, in Florida, by Prof. J. W. Bailey, of West Point. Is it probably a species of *Distomum*, with the ventral acetabulum emersed within the body?

16. *MONOSTOMUM ORNATUM* Leidy. Body slightly compressed ovoidal, anteriorly broad; yellow variegated with brownish red. Mouth infero-terminal, acetabuliform, transversely oval. Penis conical, protruding a short distance below the mouth. Female aperture a short distance below the penis. Length 1 to $1\frac{1}{2}$ lines, breadth $\frac{1}{2}$ to $\frac{3}{4}$ of a line, thickness $\frac{1}{2}$ to $\frac{3}{4}$ a line.

A dozen specimens were obtained from the abdominal cavity of *Rana pipiens*.

17. *MONOSTOMUM RENICAPITE* Leidy. Body depressed, lateral margins parallel, anteriorly and posteriorly rounded, above convex, below concave. Head formed by a transverse, reniform callosity. Mouth transversely crescentic, surrounded with a double lip. Penis a small conical tubercle. Length from $\frac{1}{2}$ an inch to 1 inch, breadth $1\frac{1}{2}$ lines.

Numerous specimens were obtained by Prof. Agassiz from the intestine of *Sphargus coriacea*.

18. ?*MONOSTOMUM MOLLE* Leidy. Body depressed, elongated elliptical, posteriorly convex. Head? mouth? Length 9 lines, breadth 2 lines.

I have found two specimens, of what I suspect to be a species of *Monostomum* in the lungs of two individuals of *Sternotherus odoratus*. The species is so soft that in the removal of the specimens I mutilated both, and since then I have been unable to find others.

19. *DISTOMUM LANCEOLATUM* Mehlis.

Reported to exist in the sheep, *Capra aries*; the ox, *Bos taurus*; and the hog, *Sus scrofa*. Stated to be frequent in the sheep, in several of the Western States.

20. *DISTOMUM HEPATICUM*.

In the hepatic ducts of the *Cervus virginianus*. Though I have never seen

specimens from the source given, yet I think there is little doubt of its existence, from the circumstance that sportsmen and hunters have frequently informed me, they had seen leeches in the liver of the deer, which they supposed the animal had swallowed in drinking. Also reported to exist in the ox, *Bos taurus*, and in the horse, *Equus caballus*.

21. *DISTOMUM VARIABILE* Leidy. *Var. a.* Body white, variegated with black in the course of the oviduct, clavate, posteriorly obtuse, minutely echinated. Neck long, narrow, cylindrical, echinated. Oral and ventral acetabula nearly equal; the latter one prominent, situated at the base of the neck. Length to 6 lines; breadth of body $\frac{1}{2}$ a line.

Var. b. Body flattened ovate, continuous with the head, anteriorly narrowed, posteriorly obtuse, color and echination as in the preceding variety. Length $2\frac{1}{2}$ lines, breadth 2 lines.

Variety *a* is found attached to the sides of the cavity of the lungs of *Tropidonotus sipedon*, singly or in groups up to six, with the head and neck buried in tumors, as in the case of the attachment of *Echinorhynchi*. Variety *b* is found detached in the mucus of the lungs and trachea. Common;—obtained in December, when the water snakes were hibernating.

22. *DISTOMUM HORRIDUM* Leidy.

Distoma horridum Leidy, Journ. A. N. S., 2d ser., i, 303.

From the excretory duct of the kidneys of the *Boa constrictor*.

23. *DISTOMUM VARIEGATUM* Rud.

Leidy, Pr. A. N. S., v, 207.

From the lungs of *Rana pipiens*.

24. *DISTOMUM RETUSUM* Dug.

Leidy, Pr. A. N. S., v, 207.

From the intestine of *Rana halcina*.

25. *DISTOMUM CYGNOIDES* Zeder.

Leidy, Pr. A. N. S., v, 207.

From the urinary bladder of *Rana pipiens*, *R. palustris*, *R. halcina*; *Salamandra maculata*, *S. rubra*, *S. salmonea*.

26. *DISTOMUM LONGUM* Leidy.

Pr. A. N. S., v, 206.

From the mouth of *Esox ester*.

27. *DISTOMUM TERRETRICOLLE* Rud.

Leidy, Pr. A. N. S., v, 206.

From the stomach of *Esox reticulatus*.

28. *DISTOMUM INCIVILE* Leidy. Body flat, elongated elliptical; echinated between the oral and ventral acetabula, which are equal, and the latter one is hemispherical and sessile. Length $2\frac{1}{2}$ to 3 lines, breadth 3-5ths to 4-5ths of a line.

Obtained from the intestine of *Leiostomus obliquus*.

29. *DISTOMUM CLAVATUM* ? Rud. Body pyriform, transversely annulated, plicated. Neck curved conical, 3 lines long. Ventral acetabulum oblique, prominent, at the base of the neck, 3 lines in diameter, with a circular aperture much larger than the mouth. Length 1 inch, breadth 4 lines.

One specimen in the collection of the Academy. Locality unknown.

30. *DISTOMUM VAGANS* Leidy.

Distoma helici Leidy, Pr. A. N. S., iii, 220.

Distomum pericardium Creplin, Arch. f. Naturg. xv, 78.

Distoma vagans Leidy, Journ. A. N. S., 2d ser., i, 304.

Cercariaeum helici alternatae Diesing, Rev. d. Cerc. 24.

Cercariaeum vagans Diesing, Rev. d. Cerc. 24.

Found in *Holix alternata* and in *H. albolabris*.

CLINOSTOMUM Leidy.

Head shorter than, and separated from the body by a lateral constriction opposite the ventral acetabulum, compressed semi-oval. Body compressed oval. Mouth anterior. Ventral acetabulum, large, hemispherical, immersed within the commencement of the body, and having a truncated conical aperture with the apex posterior. A terminal pore to the body.

31. *CLINOSTOMUM GRACILE* Leidy. Head semi-ovoid, anteriorly obliquely truncated. Mouth transversely oval, with a prominent margin and a second border, which is slightly emarginate below. Body compressed oblong, oval, convex above, concave below, obtuse posteriorly, acetabulum larger, immersed between the head and body. Length to 3 lines, breadth to 1 line.

Found in the intestine of *Esox*, and within cysts in the gills, fins, and muscles of *Pomotis vulgaris*.

32. *CLINOSTOMUM DUBIUM* Leidy. Head compressed oval, convex anteriorly; mouth minute, not bordered. Body compressed oblong oval. Ventral acetabulum immersed between the body and head. Length $2\frac{1}{2}$ lines, breadth $\frac{2}{3}$ of a line.

From the intestine of *Rusticola minor*.

33. *HOLOSTOMUM CORNU* Nitzsch.

Found in the small intestine of *Ardea herodias*.

34. *HOLOSTOMUM NITIDUM* Leidy. Body divided by a constriction at the anterior third, every where echinated. Head ovoidal; mouth terminal, round, opening into a cup-shaped pharynx. Body compressed oblong oval, variegated white with yellow. Length to $1\frac{1}{2}$ lines, breadth 2-5ths of a line.

Two specimens were obtained from the small intestine of *Rana pipiens*.

35. *DIPLODISCUS SUBCLAVATUS* Diesing.

Found in the intestine of *Rana pipiens*.

36. *DIPLOSTOMUM CUTICOLA* Diesing. Head elongated elliptical, excavated inferiorly, obtusely angular, much longer than the body. Mouth small, round, pharynx oval, gizzard oval. Generative apertures hemispherical, situated just posterior to the middle. Body ovoid, with a terminal excretory pore. Length from 1-5th to $\frac{1}{2}$ of a line. Contained in oval sacs about $\frac{1}{2}$ a line in length.

Found in great number in the liver of *Pomotis vulgaris*.

37. *ASPIDOGASTER CONCHICOLA* Baer.

Leidy, Pr. A. N. S., v, 224.

38. *MALACODIELLA GROSSA* Blain.

Leidy, Pr. A. N. S., v, 209.

CEPHALOCOTYLEA.

39. *CYSTICERCUS FASCIOLARIS* Rud.

Common in the liver of the rat, *Mus decumanus*.

40. *CYSTICERCUS CELLULOSA* Rud.

Occasionally in the muscles of the hog, *Sus scrofa*.

41. *CYSTICERCUS TENUICOLLIS* Rud.

Occasionally in the liver of the hog, *Sus scrofa*, and in the mesentery of the sheep, *Capra aries*.

42. *OYSTIOGROSSUS BLONDEATUS* Leuck.

In cysts, in the peritoneum of the European domestic rabbit, *Lepus cuniculus*.

43. *ECHINOCOCCUS GRANULOSUS* Rud.

Echinococcus polymorphus Diesing.

From a cyst, of about three inches in diameter, between the muscles on the right side of the abdomen, in an English sailor boy; and also in two large

cysts in the liver of a Frenchman. I have never met with this parasite in the Anglo-American. In three large cysts in the liver of a large species of monkey (species unknown); the specimen being preserved in the collection of the University.

44. *COENURUS CEREBRALIS* Rud.
In the sheep, *Capra aries*.

45. *TÆNIA SOLIUM* Lin.
VII. Leidy, Pr. A. N. S., ix, 443.

46. *TÆNIA LATICEPHALA* Leidy.
Ibidem.

47. *TÆNIA SERRATA* Goeze.
Ibidem.

48. *TÆNIA CUCUMERINA* Bloch.
Ibidem.

49. *TÆNIA ELLIPTICA* Batsch.
Ibidem.

50. *TÆNIA CRASSICOLLIS* Rud.
Ibidem.

51. *TÆNIA PUSILLA* Goeze.
Ibidem.

52. *TÆNIA PECTINATA* Goeze.
Ibidem.

53. *TÆNIA BACILLARIS* ? Goeze.
Ibidem.

54. *TÆNIA FESTIFERA* Leidy.
Ibidem.

55. *TÆNIA STRIGIS ACADICÆ*.
Ibidem, 444.

56. *TÆNIA VARIABILIS* ? Rud.
Ibidem.

57. *TÆNIA DISPAR* Goeze.
Tænia pulchella Leidy, Pr. A. N. S., v, 241.
Tænia dispar Goeze. Leidy, Pr. A. N. S., ix, 444.

58. *TÆNIA LACTEA* Leidy.
Pr. A. N. S., ix, 444.

59. *TÆNIA GIBBOSA* Leidy.
Ibidem.

60. *DIBOTHRUM PUNCTATUM* Rud.
Leidy. Pr. A. N. S., ix, 444.

61. *SPARGANUM REPTANS* Diesing.
Ligula reptans Diesing, Syst. Helm. i, 581.
Ligula tritonis Leidy, Pr. A. N. S., v, 96.
Sparganum affine Diesing, Verth. d. Cephalocot. 20.

62. *DIBOTHRORHYNCHUS ABDITUS* Leidy. Head continuous with the neck, apex convex and emarginate. Bothria 2, lateral continuous above, oval, with the lateral margins involute. Proboscides filiform, projecting $1\frac{1}{2}$ lines from the head. Neck tænia-form, widening posteriorly. Body constricted from the neck, narrower and longer, tænia-form, narrowing posteriorly and ending in an obtusely angular extremity. Length of head and neck 6 lines, breadth posteriorly 1 line; length of body 7 lines, breadth $3\frac{1}{2}$ ths of a line.

Four specimens were found in a large cream-colored liver, which had been left upon a stall in our fish market. I could not ascertain the species of fish from which it had been obtained, but I suspect it to be the halibut, *Hippoglossus vulgaris*. Each worm was closely coiled up at the bottom of a long clavate sac, which was composed of three distinct membranes. The first membrane adhered to the structure of the liver in which it was imbedded, beneath the peritoneum. The second membrane was transparent, crisp, and shining. The third one was milk-white, soft, and contractile; and it presented a delicate, tortuous, white opaque line extending the length on each side. After opening the third membrane, beneath water, the worm gradually crept out of its own accord.

63. PENTASTOMUM SUBCYLINDRICUM Diesing.

Pentastomum Didelphidis virginianæ Leidy, Pr. A. N. S., v, 96.

In cysts of the liver of the opossum, *Didelphis virginiana*.

64. PENTASTOMUM EURYZONUM Diesing.

In the liver of *Cynocephalus porcaricus*.

65. PENTASTOMUM PROBOSCIDEUM Rud.

In the lungs of the *Boa constrictor*.

66. PENTASTOMUM GRACILE Diesing. Body sub-clavate, incurved, most narrowed anteriorly, annular, not plicated, with the margins of the annuli microscopically denticulated. Head obtuse, bothria subterminal, elevated, each with two hooks, of which the upper one is the smaller. Mouth elevated, conical, in the focus of the semicircle formed by the bothria. Length from 3 to 4 lines, breadth $\frac{1}{2}$ of a line.

Eleven specimens were obtained by Jos. Jones from the stomach of the *Aligator mississippiensis*.

RHYNGODEA.

67. GREGARINA JULI MARGINATI.

Gregarina larvata Leidy, Pr. A. N. S., iv, 232.

Gregarina Juli marginati, Leidy, Trans. Am. Phil. Soc., 2d ser., x, 237.

68. GREGARINA JULI PUSILLI.

Leidy, Trans. Am. Phil. Soc., 2d ser., x, 238.

69. GREGARINA POLYDESMI VIRGINIENSIS.

Ibidem.

70. GREGARINA PASSALI CORNUTI.

Ibidem.

71. GREGARINA ACHETÆ ABBREVIATÆ.

Ibidem.

72. GREGARINA LOCUSTÆ CAROLINÆ.

Ibidem, 239.

73. GREGARINA BLATTARUM Siebold.

Gregarina Blattæ orientalis, Leidy, Trans. Am. Phil. Soc., 2d ser., x, 239.

74. GREGARINA SCARABEI RELICTI.

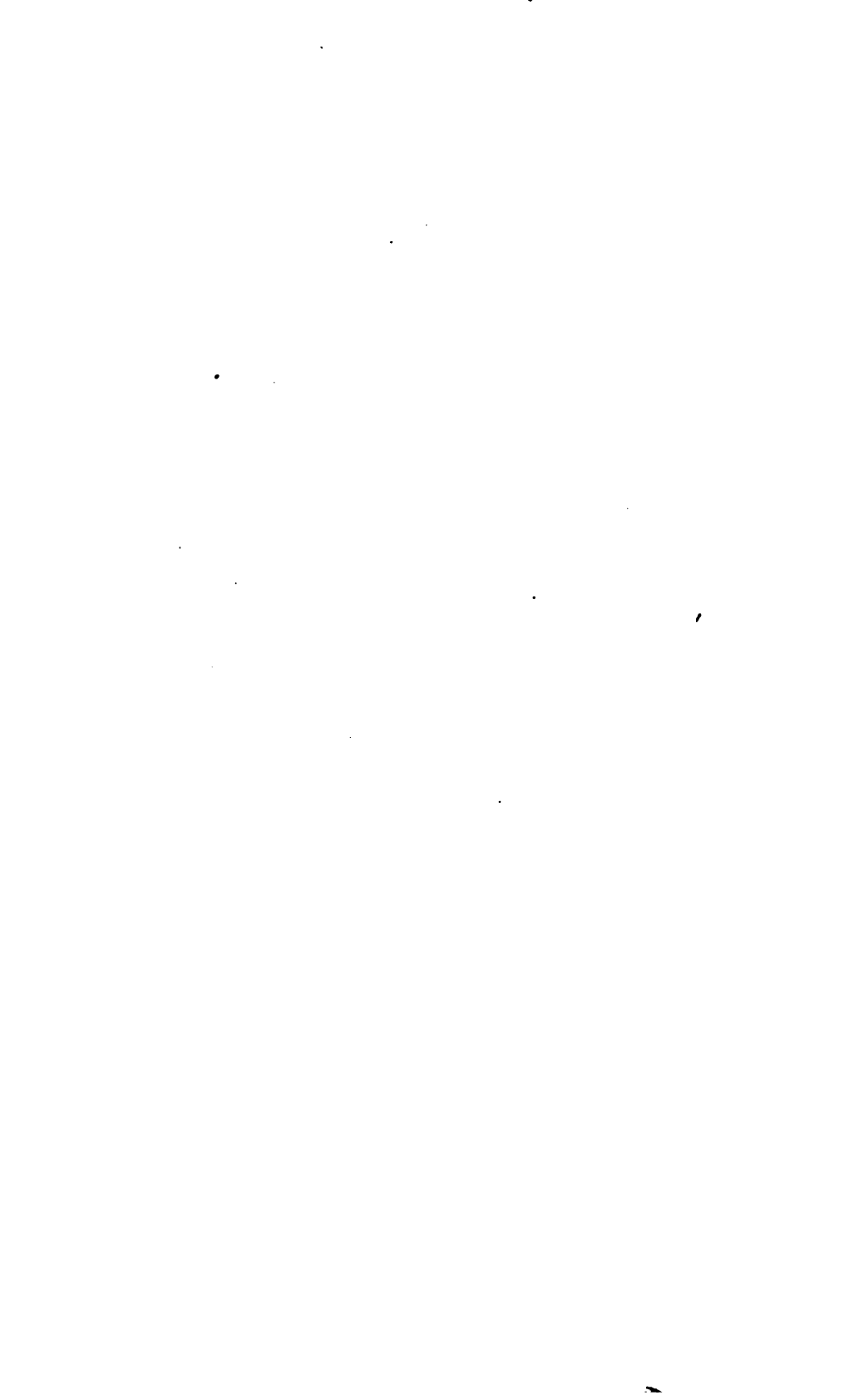
Gregarina, Leidy, Pr. A. N. S., v, 208.

Gregarina Scarabei relictæ, Leidy, Pr. A. N. S., v, 287.

75. GREGARINA MELALONTHÆ BRUNNEÆ. Body oblong oval; head oblate spheroidal, slightly elevated at the summit. Single and in pairs. Length of body .405 mm, breadth .252 mm; length of head .108 mm, breadth .144 mm. Found in the intestine of *Melalontha brunnea*.

76. GREGARINA NEREIDIS DENTICULATÆ.

Leidy, Journ. A. N. S., 2d ser., iii, 144.



Length .20.

Locality.—Middle and Southern States.

This insect is very closely allied to *C. caesia*, but differs in having the thorax wider, and the body longer and more narrow in proportion to its size.

39. *C. polygoni*. Oblong oval, brilliant metallic blue, head blue-black punctured, antennæ black, basal joint rufous beneath and at tip, thorax rufous sparsely and finely punctured, elytra brilliant metallic blue densely punctured, under surface blackish blue, legs rufous, tarsi black, anus rufous.

Length .18.

Linn. Fn. Suec. 520; Syst. Nat. 2, 589, 24. Harris, Insects, 118, (2d edition.)

C. cæruleipennis Say, J. Acad. 5, 296.

Phædon polygoni Kirby, Fn. Bor. Am. 216.

Locality.—Southern and Middle States.

40. *C. formosa*. Oblong oval, convex, above golden green, strongly punctured, thorax with the basal angles obtuse, scutellum purple, elytra strongly punctured, suture purplish, exterior edge blue, antennæ and palpi black, tibiae black, under surface violaceous.

Length .18.

Say, J. Acad. 3, 451.

Locality.—Kansas and Santa Fé.

List of Species unknown to me.

C. viminalis Linné. Mann. Bull. Mosc. 1853. Russian America.

C. lapponica Linné. Mann. Bull. Mosc. 1853. Russian America.

Phratora interstitialis Mann. Bull. Mosc. 1853.

C. basilaris Say, J. Acad. 3, 451.

C. adonidis Fabr. El. 1. 431. *Phædon adonidis* Kirby, F. B. A. 216.

Gastrophysa ænea Mels. Pr. Acad. 3, 175.

Gastrophysa raphani Fabr. Kirby, F. B. A. 216.

All the specimens, I have described in the preceding pages, are in the Cabinet of Dr. J. L. Le Conte, to whom I must return my sincere thanks for his valuable assistance and the kind loan of books and specimens.

Notes on North American Birds in the Collection of the Academy of Natural Sciences, Philadelphia, and National Museum, Washington.

By JOHN CASSIN.

1. *BUTEO MONTANUS*, Nuttall, Man. Orn. U. S. i, p. 112, (1840).

"*Buteo Swainsonii*, Bonap." Cassin, B. of Cal. and Tex. i, p. 98.

"*Falco buteo*, Linn." Aud. Orn. Biog. iv, p. 508. Aud. B. of Am. pl. 372, Oct. ed. i, pl. 6.

On examination of not less than twenty specimens of this bird from various localities in the Western countries of North America, I have found the characters constantly present which distinguish it from *Buteo borealis*, as pointed out in my Birds of California and Texas, p. 98. The voice of this species is represented by several of the late naturalists who have visited California, as quite peculiar, and I am assured by my friend Dr. Thos. M. Brewer, of Boston, that the egg is entirely different from that of *B. borealis*. Though nearly related to that species, it is very probably entitled to be regarded as distinct, for which purpose Mr. Nuttall's name as above given is proper.

This bird appears to be of common occurrence in California, being brought in nearly every collection from that country, and it is also in Dr. Suckley's collection from Washington Territory. The specimen figured by Mr. Audubon as above, and which was brought by Dr. Townsend from the Rocky Mountains, is in the collection of the Philadelphia Academy. It is the same specimen described by Mr. Nuttall, and named as above.

2. *SPIZELLA PALLIDA*, (Swainson).

Emberiza pallida, Swainson, Faun. Bor. Am., ii, p. 251 (1831).

Emberiza Shattuckii, Audubon, B. of Am., oct. ed. vii, p. 347 (1844). Aud. B. of Am. oct. ed. vii, pl. 493.

The bird described and figured by Mr. Audubon as above, is the *Emberiza pallida*, Swainson, as any one may readily determine by examining and comparing the descriptions as above cited, with or without specimens.

This species is easily recognized by its wide stripe of ashy white from the base of the bill over the eye, two longitudinal stripes on the head of brownish black, and with an intermediate or middle stripe on the top of the head ashy white. Ears and cheeks behind and below the eye pale brown, with a line of black on its lower edge, and another line of black from the corner of the lower mandible. Upper parts of body pale ashy brown, every feather on the back and wing coverts with a black longitudinal stripe; tail brown. Under parts white, tinged with ashy and pale brown on the sides and flanks. Bill and feet yellowish. Total length $5\frac{1}{2}$ inches, wing $2\frac{1}{2}$, tail $2\frac{1}{2}$ inches.

Hab. Western North America, California. Spec. in Mus. Acad. Philada., and Nat. Mus. Washington.

3. *SPIZELLA BREWERI*, nobis.

"*Emberiza pallida*, Swains." Audubon, Orn. Biog. v, p. 66. Aud. B. of Am. pl. 398. oct. ed. iii, pl. 161.

This species has the head above and other upper parts uniform pale ashy brown, every feather having a narrow brownish black line, a short and obscure stripe of ashy white over the eye. No stripes on the head, as in the preceding. Under parts ashy white. Bill and feet yellowish. Total length 5 inches, wing $2\frac{1}{2}$, tail $2\frac{1}{2}$ inches.

Hab. Western North America, California, New Mexico. Spec. in Mus. Acad. Philada., and Nat. Mus. Washington.

Easily distinguished from the preceding by the absence of the stripes on the head, so strongly characterizing that species and smaller size. It is apparently a much more abundant species, being brought in nearly all collections from California and New Mexico.

I have much pleasure in embracing the present opportunity to dedicate a bird of the United States to my esteemed friend Thomas M. Brewer, M. D., of Boston, one who to the highest abilities and social qualities adds an ardor in devotion to Ornithological science rarely paralleled.

4. *TOTANUS BREVIPES*, Vieill. Nouv. Dict. vi, p. 410 (1816).

Totanus fuliginosus, Gould, Voy. Beagle, Birds p. 130 (1841).

Scolopax undulata, Forster, Desc. An. p. 173 (1844).

Totanus polynesiæ, Peale, Voy. Vincennes and Peacock, Birds p. 237 (1848).

Totanus pulverulentus, Müller, Verh. p. 153 (1844)?

Totanus oceanicus, Lesson, Comp. aux Œuv. de Buffon. p. 244 (1847).

Tringa glareola, Pallas, Zoog. Ross. As. ii, p. 194 (1831).

Pallas Zoog. Rosso-As. Birds, pl. 60. Temm. and Schl. Fauna Japon. Birds, pl. 65?

About the size of or rather larger than *T. flavipes*. Wing long, pointed, first primary longest, secondaries short, truncate, emarginate, tertiaries long, tarsi and toes rather short, tibia feathered about two-thirds of its length.

Adult.—Entire upper parts, neck, breast and sides dark lead colored, uniform and without white marks; throat, middle of abdomen, ventral region and under tail coverts white. Under wing coverts white, spotted and barred with dark lead color. A stripe of white from the base of the bill over the eye, lores brownish black, eye enclosed in a narrow circle of white. Quills dark brown, shaft of the first primary white on its upper surface; shafts of the other primaries reddish brown on their upper surface, and of all on their under surfaces, white. Tail lead colored, uniform with the upper parts of the body, shafts of tail feathers lead colored above, white beneath. Bill dark, feet greenish.

Younger.—Upper parts as above, entire under parts transversely barred with

dark ashy brown and white, the former predominating on the sides and flanks. Throat and middle of the abdomen white.

Dimensions.—Total length (of skin) about 10½ inches, wing 6½ inches, tail 3½ inches.

Hab. Islands in the Pacific Ocean, Washington Territory, (Dr. J. G. Cooper) Spec. in Nat. Mus. Washington, and Mus. Acad. Philada.

For the first time within the limits of the United States, this extensively diffused species has been found in Washington Territory, the extreme north west portion of this Republic, by J. G. Cooper, M. D., naturalist attached to the party which surveyed the most northern proposed route for a rail-road to the Pacific Ocean, and commanded by Hon. I. I. Stevens. It is a small species uniformly colored above, and not difficult to distinguish from any other of its genus yet discovered in the United States.

This species possesses an extensive range of locality, probably including the greater part of the entire western coast of North and South America, the Sandwich and Feejee Islands, and is very nearly allied to, if not identical with the Japanese species, figured as above in Fauna Japonica. It has, moreover, quite a redundancy of names, a portion of which we cite above. Pallas gives this species as an inhabitant of Kamtschatka and the Russian American islands.

5. *ANAS HYPERBORÆUS*, Pallas, *Spicilegium Zoologicum*, i, pt. vi, p. 25, (1769.)

Anas nivalis, Forster, Phil. Trans. London, lxii, p. 413, (1772.)

Wilson, Am. Orn. viii, pl. 68, fig. 5. Aud. B. of Am. pl. 381, fig. 1, oct. ed. vi, pl. 381, fig. 1.

This species is either liable to great variation in size and color of plumage, or three distinct birds have been confounded under one name. My present information inclines me to the opinion that the latter is the truth; after having collected numerous specimens now in the Museum of the Academy, and rather carefully noted the observations of northern voyagers and of naturalists attached to Arctic Expeditions.

Two distinct sizes appear to be constant in the same sexes of specimens that are perfectly white, with the black tips of the primaries and the ferruginous markings on the head and face in both, and these I regard at present as distinct species. The larger is the bird described by Pallas and Forster and by all American authors as the Snow Goose, and is much the more frequent on the Atlantic coast of North America. It is figured by the authors above cited and by others, and specimens are frequently brought to the markets of the cities, though some winters have passed in Philadelphia in which I have not noticed it. Specimens of adults and young are in the Museum of this Academy, the young being distinguished by the prevalence of a cinereous color on the upper parts of the head, neck and body. Sexes alike, female slightly smaller.

Dimensions.—Male. Total length (of skin) about 31 inches, wing 18½, tail 6½, bill from the tip to frontal feathers along the culmen 2½, to gape 2½, tarsus 3½ inches.

6. *ANAS ALBATUS*, nobis.

Form.—Smaller than the preceding, bill shorter, bare space at the base of the upper mandible not extending so far into the feathers (on the sides of the bill in front.) Wing long, second quill longest, tail short but comparatively rather longer than in the preceding, which is also the case with the tarsus.

Dimensions.—Male. Total length (of skin) about 25 inches, wing 15½, tail 5½, bill measured along the culmen from tip to frontal feathers 2, to gape 2, tarsus 3 inches. Sexes alike, female slightly smaller.

Colors.—Adult. Entire plumage white, except primaries, which are pale cinereous at base and black in the terminating two-thirds of their length. Front and cheeks spotted with ferruginous, bill and feet red.

Hab.—Western and Northern America, Oregon, rare on the Atlantic.

A single specimen from Oregon is in the collection of the Exploring Expedition in the Vincennes and Peacock, and four specimens, which occurred in pairs, have come under my notice in the market at Philadelphia in the course of twenty years. These five specimens are all that I have seen of this species, and it is

124. *ASCARIS ACUTA* Müller.

A single male, 14 lines long and $\frac{1}{2}$ of a line broad, was obtained from the intestine of *Platessa plana*.

125. *ASCARIS NEGLECTA* Leidy. Body cylindro-fusiform, most narrowed anteriorly. Head naked; lips large, obtuse. Tail short, conical, acute. Length of female 2 inches, breadth three-fifths of a line; male about half the size.

Twelve specimens were obtained by Prof. Baird, from the intestine of *Diodon maculo-striatus*.

126. *ASCARIS CLAVATA* Rud. Head with a linear ridge on each side. Tail short, conical, incurved, mucronate; in the female with a linear ridge extending forward on each side. Length of female to $3\frac{1}{2}$ inches, breadth $\frac{1}{2}$ of a line; length of male to 2 inches, breadth to $\frac{1}{2}$ a line.

Numerous specimens were obtained by Prof. Agassiz from the intestine of *Morrhua pruinosa*, and I have obtained others from the intestine of *Morrhua americana*.

127. *ASCARIS CYLINDRICA* Leidy.

Angiostomum? *cylindricum* Diesing, Syst. Helm. ii, 559.

Ascaris cylindrica Leidy, Pr. A. N. S., iv, 229. Body cylindroid, equally attenuated towards the extremities, curved. Mouth distinctly trilabiate. Tail narrow, conical, curved, acute. Female generative aperture just posterior to the middle. Length four-fifths of a line, breadth one-twelfth of a line.

Found in the intestine of *Helix alternata*. No cartilaginous pharynx as in *Angiostomum*!

128. *ASCARIS INFECTA* Leidy.

Pr. A. N. S., iv, 229; Faun. and Flora within Liv. An. 42.

Found in the ventriculus of *Julus marginatus*.

129. *SYNPLECTA PENDULA* Leidy.

Pr. A. N. S., v, 240.

From the stomach of *Emys guttata*.

130. *OXYURIS COMPAR* Leidy. Body fusiform; head continuous with the body, subacute, with a dilatation of the epidermis; mouth small. Tail of female long, subulate, spirally contorted; the generative aperture one-fifth the length of the body from the head. Length of female 4 to 7 lines, breadth $\frac{1}{2}$ of a line; length of tail from the anus $1\frac{1}{2}$ lines.

Seventeen specimens were found in company with others of *Tænia crassicollis* in the small intestine of the cat, *Felis catus*. Œsophagus long, pestle-form; gizzard globulo-pyriform; intestine dilated at the commencement, afterwards cylindrical. Males were not seen.

131. *OXYURIS OURVULA* Rud.

Intestine of the horse, *Equus caballus*.

132. ? *OXYURIS DUBIA* Leidy. Body fusiform, curved. Head continuous with the body, naked. Mouth unarmed. Female generative aperture about the middle of the body. Tail abruptly narrowed, acutely conical. Length of female $1\frac{1}{2}$ lines, breadth $\frac{1}{2}$ of a line. Male not seen.

Found in the cæcum of *Bufo americanus*, and of *Salamandra rubra*.

✓ *SPIRONOURA* Leidy.

✓ Body cylindroid, attenuated at the extremities. Head continuous with the body. Mouth round, surrounded by a circular papillated lip. Caudal extremity of male spiral, acute, tuberculate, with the two spicula of the penis curved, ensiform, costate; of the female conical, acute, with the generative aperture at the posterior third of the body.

133. *SPIRONOURA GRACILE* Leidy. Body of female incurved; that of male spiral posteriorly. Head naked; mouth with a circular lip of 6 papillæ. Tail of female long, calcarate, acute; of male, with two rows each of three tubercles. Spicula

of penis curved ensiform, costate, emarginate at the extremity. Length of female 8 lines, breadth $\frac{1}{2}$ of a line; length of male to 4 lines, breadth to $\frac{1}{2}$ of a line.

Found in the stomach of *Emys serrata*. Oesophagus long, pestle-form, gizzard globular, commencement of the intestine cordiform, rectum short, wide, pyriform. Ovaries double.

134. SPIRONOURA AFFINE Leidy. Body of female curved; that of male posteriorly spiral. Head naked; mouth with a circular lip of 6? papillae. Tail of female nearly straight, moderately long, conical, acute; of the male, conical, incurved, with a pair of tubercles on each side near the end. Spicula of penis curved, ensiform, costate, acute. Length of female $4\frac{1}{2}$ lines, breadth one-fifth of a line; length of male 3 lines, breadth $\frac{1}{2}$ of a line.

Found in the cocum of *Cistudo carolina*.

135. PHYSALOPTERA TURGIDA Rud.

Spiroptera Didelphis virginiana. Leidy, Pr. A. N. S., v, 155.

Common in the stomach of *Didelphis virginiana*. Found by Dr. Goddard, Mr. Schaffhirt, and myself; and also by Mr. Jos. Jones, in Georgia.

136. PHYSALOPTERA LIMBATA Leidy.

Spiroptera Scalopsis canadensis. Leidy, Pr. A. N. S., v, 156. The mouth bilabiate and surrounded by an elevated linear margin. Alae of male, each with 4 diverging costae. The length 6 lines, breadth $\frac{1}{2}$ of a line.

137. PHYSALOPTERA MUCHONATA Diesing.

Numerous specimens were obtained by Mr. Joseph Jones, from the stomach of the *Alligator mississippiensis*, in Georgia.

138. PHYSALOPTERA CONSTRICTA Leidy. Body white, with the brown intestine shining through, cylindrical to within a short distance of the extremities, incurved; anterior extremity with one or two constrictions, and abruptly inflexed. Lips large, lateral, constricted from the body, each trilobate. Tail of female incurved, abruptly conical and acute; of the male alated, with the alae narrow, long, and turgid. Length of female $1\frac{1}{2}$ inches, breadth two-fifths of a line; male half the size.

Found frequently in the stomach of *Tropidonotus sipedon*, with the anterior extremity of the body hooked through the mucous membrane, and very tightly adhering by means of the one or two constrictions.

139. PHYSALOPTERA CONTORTA Leidy. Body capillary, most narrowed anteriorly, with the posterior four-fifths spirally contorted; white, with the intestine brown. Lips prominent, constricted from the body, trilobate. Tail short, conical, acute; in the male with narrow alae, each furnished with five funnel-shaped pores. Length of female from 6 lines to an inch; breadth to $\frac{1}{2}$ of a line; male from one half to three-fourths the size.

Frequent in the stomach of *Emys serrata*, *Emys reticulata*, *Cistudo carolina*, and *Kinosternum pennsylvanicum*, adhering to the mucous membrane in the same manner as *Physaloptera constricta*.

140. PHYSALOPTERA AMBUSTA Leidy. Body most narrowed anteriorly, incurved. Mouth distinctly bilabiate; lips lateral, prominent. Caudal extremity incurved, obtusely conical. Length 10 lines, breadth $\frac{1}{2}$ a line.

One specimen was obtained by Mr. Jos. Jones, from the stomach of *Psammodiplosis flagelliformis*.

141. CHEIRACANTHUS HORREDDUS Leidy. Body subcylindrical, incurved, posteriorly sub-clavate, obtuse; anteriorly covered with palmate plates, furnished with as many as eight spines, and degenerating posteriorly to single spines. Head oblate-spheroidal, spirally echinate. Mouth bilabiate, with the lips lateral and papillated. Length of female $2\frac{1}{2}$ inches, breadth $1\frac{1}{2}$ lines. Male not seen.

Four specimens were obtained by Mr. Joseph Jones, in the stomach of the *Alligator mississippiensis* in Georgia.

142. TRICOCEPHALUS DISPAR Rud.

Not unfrequent in the children of the Anglo-american, and also in the negro.

cysts in the liver of a Frenchman. I have never met with this parasite in the Anglo-American. In three large cysts in the liver of a large species of monkey (species unknown); the specimen being preserved in the collection of the University.

44. *CORNURUS CEREBRALIS* Rud.
In the sheep, *Capra aries*.
45. *TENIA SOLIUM* Lin.
VII. Leidy, Pr. A. N. S., ix, 443.
46. *TENIA LATICEPHALA* Leidy.
Ibidem.
47. *TENIA SERRATA* Goeze.
Ibidem.
48. *TENIA CUCUMERINA* Bloch.
Ibidem.
49. *TENIA ELLIPTICA* Batsch.
Ibidem.
50. *TENIA CRASSICOLLIS* Rud.
Ibidem.
51. *TENIA PUBILLA* Goeze.
Ibidem.
52. *TENIA PECTINATA* Goeze.
Ibidem.
53. *TENIA RACILLARIS* ? Goeze.
Ibidem.
54. *TENIA PESTIFERA* Leidy.
Ibidem.
55. *TENIA STRIGIS ACADICÆ*.
Ibidem, 444.
56. *TENIA VARIABILIS* ? Rud.
Ibidem.
57. *TENIA DISPAR* Goeze.
Tenia pulchella Leidy, Pr. A. N. S., v, 241.
Tenia dispar Goeze. Leidy, Pr. A. N. S., ix, 444.
58. *TENIA LACTEA* Leidy.
Pr. A. N. S., ix, 444.
59. *TENIA GIBBOSA* Leidy.
Ibidem.
60. *DIBOTHRUM PUNCTATUM* Rud.
Leidy. Pr. A. N. S., ix, 444.
61. *SPARGANUM REPTANS* Diesing.
Ligula reptans Diesing, Syst. Helm. i, 581.
Ligula tritonis Leidy, Pr. A. N. S., v, 96.
Sparganum affine Diesing, Verth. d. Cephalocot. 20.
62. *DIBOTHRORHYNCHUS ABDITUS* Leidy. Head continuous with the neck, apex convex and emarginate. Bothria 2, lateral continuous above, oval, with the lateral margins involute. Proboscides filiform, projecting $1\frac{1}{2}$ lines from the head. Neck tænia-form, widening posteriorly. Body constricted from the neck, narrower and longer, tænia-form, narrowing posteriorly and ending in an obtusely angular extremity. Length of head and neck 6 lines, breadth posteriorly 1 line; length of body 7 lines, breadth 3-5ths of a line.

Four specimens were found in a large cream-colored liver, which had been left upon a stall in our fish market. I could not ascertain the species of fish from which it had been obtained, but I suspect it to be the halibut, *Hippoglossus vulgaris*. Each worm was closely coiled up at the bottom of a long clavate sac, which was composed of three distinct membranes. The first membrane adhered to the structure of the liver in which it was imbedded, beneath the peritoneum. The second membrane was transparent, crisp, and shining. The third one was milk-white, soft, and contractile; and it presented a delicate, tortuous, white opaque line extending the length on each side. After opening the third membrane, beneath water, the worm gradually crept out of its own accord.

63. *PENTASTOMUM SUBCYLINDRICUM* Diesing.

Pentastomum Didelphidis virginianæ Leidy, Pr. A. N. S., v, 96.

In cysts of the liver of the opossum, *Didelphis virginiana*.

64. *PENTASTOMUM EURYZONUM* Diesing.

In the liver of *Cynocephalus porcarius*.

65. *PENTASTOMUM PROBOSCIDEUM* Rud.

In the lungs of the *Boa constrictor*.

66. *PENTASTOMUM GRACILE* Diesing. Body sub-clavate, incurved, most narrowed anteriorly, annular, not plicated, with the margins of the annuli microscopically denticulated. Head obtuse, bothria subterminal, elevated, each with two hooks, of which the upper one is the smaller. Mouth elevated, conical, in the focus of the semicircle formed by the bothria. Length from 3 to 4 lines, breadth $\frac{1}{2}$ of a line.

Eleven specimens were obtained by Jos. Jones from the stomach of the *Aligator mississippiensis*.

RHYNGODEA.

67. *GREGARINA JULI MARGINATI*.

Gregarina larvata Leidy, Pr. A. N. S., iv, 232.

Gregarina Juli marginati. Leidy, Trans. Am. Phil. Soc., 2a . x, 237.

68. *GREGARINA JULI FUSILLI*.

Leidy, Trans. Am. Phil. Soc., 2d ser., x, 238.

69. *GREGARINA POLYDESMI VIRGINIENSIS*.

Ibidem.

70. *GREGARINA PASSALI CORNUTI*.

Ibidem.

71. *GREGARINA ACHETÆ ABBREVIATÆ*.

Ibidem.

72. *GREGARINA LOCUSTÆ CAROLINÆ*.

Ibidem, 239.

73. *GREGARINA BLATTARUM* Siebold.

Gregarina Blatta orientalis. Leidy, Trans. Am. Phil. Soc., 2d ser., x, 239.

74. *GREGARINA SCARABEI RELICTI*.

Gregarina. Leidy, Pr. A. N. S., v, 208.

Gregarina Scarabei relictæ. Leidy, Pr. A. N. S., v, 287.

75. *GREGARINA MELALONTHÆ BRUNNEÆ*. Body oblong oval; head oblate spheroidal, slightly elevated at the summit. Single and in pairs. Length of body .405 mm, breadth .252 mm; length of head .108 mm, breadth .144 mm.

Found in the intestine of *Melalontha brunnea*.

76. *GREGARINA NEREIDIS DENTICULATÆ*.

Leidy, Jour. A. N. S., 2d ser., iii, 144.

77. ECHINORHYNCHUS OVATUS Leidy.

Pr. A. N. S., v, 97, (1850.)

Echinorhynchus campanulatus Diesing, Syst. Helm. ii, 21, (1851.).From the small intestine of *Felis leopardus*.

78. ECHINORHYNCHUS GIGAS Goeze.

Small intestine of the hog, *Sus scrofa*.

79. ECHINORHYNCHUS MICROCEPHALUS Rud.

Echinorhynchus tortuosus Leidy, Pr. A. N. S., v, 97.Found in the mesentery of *Didelphis virginiana*.

80. ECHINORHYNCHUS STRIATUS Goeze. Body cylindro-clavate, anteriorly minutely echinated. Proboscis obovate, with 12 to 15 circles of hooks. Neck short, conical, unarmed. Length to 10 lines; breadth anteriorly $1\frac{1}{2}$ lines. Color, orange.

Several specimens were obtained by Jos. Jones from the intestine of *Tantulus loculator*.

81. ECHINORHYNCHUS MANIFESTUS Leidy.

Echinorhynchus Pici collaris. Leidy, Pr. A. N. S., v, 98. Body slightly compressed cylindroid, most dilated anteriorly, obtuse posteriorly, transversely corrugated. Proboscis subpyriform, with the rounded apex armed with 3 or 4 rows of hooks. Neck a simple linear constriction. Length 8 lines to an inch.

Several specimens were found in the intestine of *Picus collaris*.

82. ECHINORHYNCHUS HAMULATUS Leidy.

Echinorhynchus emydis. Leidy, Pr. A. N. S., v, 207. Body long, white, sub-clavate, curved. Proboscis sub-globular, with a single row of strong hooks and a few rudimental hooklets. Length 2 to 14 lines, breadth to $\frac{1}{2}$ of a line.

Frequent in the intestine of *Emys geographica*, *E. insculpta*, *E. guttata*, and *E. serrata*. From several individuals of the latter species, Mr. Joseph Jones obtained more than a hundred specimens.

83. ECHINORHYNCHUS ACUS Rud.

Intestine of *Morrhua americana*.

84. ECHINORHYNCHUS PROTEUS Westrumb.

Pr. A. N. S., v, 208.

Intestine of *Labrax lineatus*.

85. ECHINORHYNCHUS GLOBULOSUS? Rud.

Echinorhynchus lateralis Leidy, Pr. A. N. S., v, 207. Body sub-fusiform, most narrowed posteriorly. Proboscis cylindrical, projecting laterally, furnished with 12 to 14 rows of hooks. Neck very short. Length to 1 inch, breadth to two-fifths of a line.

Intestine of *Salmo fontinalis*; obtained by Prof. Baird and Prof. Agassiz.

86. ECHINORHYNCHUS ANGUSTATUS? Rud.

Echinorhynchus socialis Leidy, Pr. A. N. S., v, 156. Body cylindroid, narrowing posteriorly, frequently dilated anteriorly. Proboscis cylindrical, with 26 rows of hooks. Neck very short, conical, unarmed. Length from 6 lines to $2\frac{1}{2}$ inches, breadth to $\frac{1}{2}$ of a line.

Frequent in the intestine of *Platessa plana*.

NEMATOIDEA.

87. TRICHINA SPIRALIS Owen.

Occasional in the Anglo-american.

88. TRICHINA AFFINIS Diesing.

Trichina spiralis Owen. Leidy, Pr. A. N. S., iii, 108.Observed in the muscles of the hog, *Sus scrofa*.

89. ANGUILLULA ACUTI Ehrenberg.

Common in ordinary cider vinegar.

90. *ANGUILLULA GLUTINIS* Ehrenberg.

Common in paste of wheat, rye, tragacanth, &c.

91. *ANGUILLULA SOCIALIS* Leidy.

Oxyuris socialis Leidy, Pr. A. N. S., v, 102.

Found in the intestine of the black cricket, *Acheta abbreviata*.

92. *ANGUILLULA LONGA* Leidy.

Pr. A. N. S., v, 225.

Found in ditches near Philadelphia.

93. *ANGUILLULA FOSSULARIS* Leidy.

Pr. A. N. S., v, 226.

Found in stagnant ponds near Philadelphia.

94. *AMELYURA SERPENTULUS*? Hemp. et Ehrenb.

Anguillula longicauda Leidy, Pr. A. N. S., v, 225. Mouth with cirri (*error in the previous observation and description*). Tail long, subulate; suctorial disk exceedingly minute, clavate. Length to one-fortieth of an inch.

Common about gutters and water spouts in Philadelphia.

95. *HYSTRICINATUS RIGIDUS* Leidy.

Pr. A. N. S., v, 102; Flora and Fauna within Liv. An. 44.

PONTONEMA Leidy.

Body capillary, narrowing towards the extremities. Head continuous with the body, truncated, or obtuse and surmounted with angular papillae, cirrated. Eyes none. Tail obtuse. Generative aperture ventral, near the middle of the body. Oesophagus long, cylindro-clavate; gizzard none, intestine straight, capacious; anus ventral and posterior.

96. *PONTONEMA VACILLATUM* Leidy.

Jour. A. N. S., 2d ser. iii, 144. Body cylindroid, anteriorly with longitudinal rows of short cirri in addition to those of the head; posteriorly incurved; tail short, thick, conical, obtuse. Length to 9 lines, breadth to one-fifth of a line.

Found on the sea shore of Rhode Island, beneath stones, between tides.

97. *PONTONEMA MARINUM* Leidy.

Jour. A. N. S., 2d ser., iii, 144. Body cylindroid; head convex; mouth surrounded with angular papillae. Cirri 4, at the side of the head. Tail long, narrow, conical, obtuse. Length to 3 lines.

Found at the bottom of a sound on the coast of New Jersey.

POTAMONEMA Leidy.

Body filiform, narrowing towards the extremities. Head continuous with the body, slightly dilated, obtuse. Mouth large, infundibuliform, unarmed; oesophagus narrow, flexuous, membranous, gradually expanding into a capacious, straight, cylindrical intestine; anus none? or exceedingly indistinct. Caudal extremity obtuse. Generative aperture of the female near the middle of the body.

98. *POTAMONEMA NITIDUM* Leidy. Body cylindroid, most narrowed anteriorly. Head without appendages. Caudal extremity broad, obtusely conical. Length 5 lines, breadth one-fifth of a line.

An active, wriggling, glistening white worm, found among beds of *Valeriana americana*, growing in the river Schuylkill, near Philadelphia.

NEMA Leidy.

Body ascaridiform. Head without appendages. Mouth unarmed, large, infundibuliform, oesophagus tubular, membranous, expanding into a simple straight intestine; anus ventral. Tail conical, acute, recurved. Generative aperture near the middle of the body.

99. *NEMA VACILLANS* Leidy. Body white, glistening. Length $1\frac{1}{2}$ millimetres, breadth .050 mm. Tail .115 mm. long.

An active wriggling worm, found about some dead specimens of a black *Phryganea*, which was infested with a fungus parasite, and attached to stones at the water's edge of a small brook near Philadelphia.

100. *STREPTOSTOMUM AGILE* Leidy.

Pr. A. N. S., iv, 230; v, 285; Flora and Fauna within Liv. An. 45.

Aorurus Leidy, Pr. A. N. S., iv, 230; v, 284.

101. *STREPTOSTOMUM GRACILE* Leidy.

Pr. A. N. S., iv, 100; v, 285; Flora and Fauna, 46.

In parte *Oxyuris Diesingii* Hammerschmidt, Isis, 354, (1848).

In parte *Oxyuris Blattæ orientalis* Hammerschmidt, Naturw. Ab. v. Haid., i., 284.

In parte *Anguillula macrura* Diesing, Syst. Helm. ii, 134.

102. *THELASTOMUM ATTENUATUM* Leidy.

Pr. A. N. S., iv., 231; v, 285; Flora and Fauna, within Liv. An. 46.

Aorurus Leidy, Pr. A. N. S., iv, 230; v, 284.

103. *THELASTOMUM APPENDICULATUM* Leidy.

Pr. A. N. S., v, 101; ib. 285; Flora and Fauna, 47.

In parte *Oxyuris Blattæ orientalis* Hammerschmidt, Naturw. Ab. v. Haid., i., 284.

In parte *Anguillula macrura* Diesing, Syst. Helm. ii, 134.

104. *THELASTOMUM LABIATUM* Leidy.

Pr. A. N. S., v, 101; ib. 285; Flora and Fauna, 47.

105. *THELASTOMUM ROBUSTUM* Leidy.

Pr. A. N. S., v, 101; ib. 285; Flora and Fauna, 48.

Thelastomum brevicaudatum? Leidy, Pr. A. N. S., v, 208; ibidem.

106. *THELASTOMUM VENUSTUM* Leidy. Body of female fusiform, straight, with the tail long, narrow, conical, straight, acute. Body of male incurved, with the tail short, depressed, ending in a recurved subulate point, and having a pair of oblong lobes or alæ, extending the length ventrally. Generative and anal apertures terminating together abruptly. Penis a curved, conical, acute spiculum. Length of female to $2\frac{1}{2}$ lines, breadth to one-fifth of a line; length of male to 1 line, breadth $\frac{1}{2}$ of a line.

Found in great number within the large intestine of *Testudo polyphemus*. Obtained by Mr. Joseph Jones in Georgia. It is a singular fact, that this species is infested with vegetable parasites, as in the case of those found in myriapods and insects.

107. *ASCARIS VERMICULARIS* Lin.

This species is the most common of all the parasitic worms, in the anglo-american.

108. *ASCARIS LUMBRICOIDES* Lin.

This species is the second of the most common of parasitic worms in the anglo-american.

In the University museum, there is a preparation of the liver of a boy, in which a number of individuals of this worm have forced themselves into the divisions of the hepatic duct.

Frequent also in the small intestines of the hog, *Sus scrofa*.

109. *ASCARIS LEPTOPTERA* Rud.

Ascaris Felis discoloris Leidy, Pr. A. N. S., v, 155.

Found in the small intestine of the panther, *Felis concolor*.

110. *ASCARIS MYSTAX* Rud.

Common in the domestic cat, *Felis catus*.

111. *ASCARIS MARGINATA* Rud.

Frequent in the dog, *Canis familiaris*.

112. *ASCARIS COLUMBARIIS* Leidy.

Ascaris alienata Rud. Leidy, Pr. A. N. S., v, 205. Body very uniformly cylindrical until within a short distance of the extremities. Head naked; lips prominent. Tail short, conical, obtuse, in the male incurved. Length of female 4 inches, breadth $1\frac{1}{2}$ lines; length of male 2 inches, breadth $\frac{1}{2}$ a line.

Two specimens, male and female, were found in the intestine of *Mephitis chinga*.

113. *ASCARIS LEWIS* Leidy. Body cylindrical, narrowing at the extremities. Head naked; lips prominent. Tail conical, mucronate. Length of female $3\frac{1}{2}$ inches, breadth $1\frac{1}{2}$ lines. Male not seen.

A single specimen was obtained by Mr. Packard, from the intestine of *Arctomys monax*.

114. *ASCARIS TENTACULATA* Rud.

Found in the intestine of *Didelphis virginiana*.

115. *ASCARIS VESICULARIS* Frölich.

COMMON in the cæcum of the turkey *Meleagris gallopavo*, and of the fowl, *Phasianus gallus*.

116. *ASCARIS INFLEXA* Rud.

Common in the small intestine of the fowl, *Phasianus gallus*.

117. *ASCARIS SERPENTULUS* Rud.

One female, $1\frac{1}{2}$ inches long, was obtained by Mr. Schafhirt from the intestine of *Ardea violacea*.

118. *ASCARIS LONGA* Leidy. Body most narrowed anteriorly, and only slightly so at the posterior fourth. Head naked, subacute; lips slightly prominent. Tail obtusely rounded, with the anus forming a transverse, subcrescentic fissure nearly at its extremity. Length of the female 9 inches, breadth $1\frac{1}{2}$ lines. Male not seen.

A single specimen was obtained by Mr. Joseph Jones, from the intestine of *Tantalus loculator*, in Georgia.

119. *ASCARIS TENUICOLLIS* Rud.

Frequent in the stomach and intestine of the *Alligator mississippiensis*.

120. *ASCARIS ANOURA* Dujardin.

Eight specimens were obtained from the intestine of *Coluber constrictor*. The females measure up to 6 inches in length by 1 line in breadth; the males $3\frac{1}{2}$ inches in length by $\frac{1}{2}$ of a line in breadth. Six specimens, apparently of this species were sent to me by Prof. Agassiz. They were obtained with nearly a pint of others, from the intestine of the *Boa constrictor*. I do not feel positive that they are really of the same species, as the specimens are too badly preserved to ascertain the fact correctly; but the size and details of form agree pretty closely.

121. *ASCARIS NUDA* Leidy. Body most narrowed anteriorly. Head naked, with the epidermis closely adherent; lips large, oblong. Tail short, incurved, conical, minutely mucronate. Length of female 2 to $2\frac{1}{2}$ inches, breadth $\frac{1}{2}$ to $\frac{1}{2}$ a line. Male not seen.

Two females were obtained from the intestine of *Crotalus adamanteus*, by Mr. Schafhirt. Is this probably the same as the last species?

122. *ASCARIS HUMILIS* Leidy. Body cylindroid, recurved, white. Head obtuse, naked; mouth trilobed? pharyngeal apparatus none; œsophagus pestle-form. Tail substraight, conical, acute. Length 2 lines, breadth one-tenth of a line.

Eight specimens were obtained from the lungs of *Tropidonotus viridis*, in December.

123. *ASCARIS ENTOMELAS* Leidy.

Proc. A. N. S., v, 206.

From the lungs of *Rana hateracina*.

124. *ASCARIS ACUTA* Müller.

A single male, 14 lines long and $\frac{1}{2}$ of a line broad, was obtained from the intestine of *Platessa plana*.

125. *ASCARIS NEGLECTA* Leidy. Body cylindro-fusiform, most narrowed anteriorly. Head naked; lips large, obtuse. Tail short, conical, acute. Length of female 2 inches, breadth three-fifths of a line; male about half the size.

Twelve specimens were obtained by Prof. Baird, from the intestine of *Diodon maculo-striatus*.

126. *ASCARIS CLAVATA* Rud. Head with a linear ridge on each side. Tail short, conical, incurved, mucronate; in the female with a linear ridge extending forward on each side. Length of female to $3\frac{1}{2}$ inches, breadth $\frac{3}{4}$ of a line; length of male to 2 inches, breadth to $\frac{1}{2}$ a line.

Numerous specimens were obtained by Prof. Agassiz from the intestine of *Morrhua pruinosa*, and I have obtained others from the intestine of *Morrhua americana*.

127. *ASCARIS CYLINDRICA* Leidy.

Angiostomum? *cylindricum* Diesing, Syst. Helm. ii, 559.

Ascaris cylindrica Leidy, Pr. A. N. S., iv, 229. Body cylindroid, equally attenuated towards the extremities, curved. Mouth distinctly trilabiate. Tail narrow, conical, curved, acute. Female generative aperture just posterior to the middle. Length four-fifths of a line, breadth one-twelfth of a line.

Found in the intestine of *Helix alternata*. No cartilaginous pharynx as in *Angiostomum*!

128. *ASCARIS INFECTA* Leidy.

Pr. A. N. S., iv, 229; Faun. and Flora within Liv. An. 42.

Found in the ventriculus of *Julus marginatus*.

129. *SYNPLECTA PENDULA* Leidy.

Pr. A. N. S., v, 240.

From the stomach of *Emys guttata*.

130. *OXYURIS COMPAR* Leidy. Body fusiform; head continuous with the body, subacute, with a dilatation of the epidermis; mouth small. Tail of female long, subulate, spirally contorted; the generative aperture one-fifth the length of the body from the head. Length of female 4 to 7 lines, breadth $\frac{1}{2}$ of a line; length of tail from the anus $1\frac{1}{2}$ lines.

Seventeen specimens were found in company with others of *Tenias crassicolis* in the small intestine of the cat, *Felis catus*. Oesophagus long, pestle-form; gizzard globulo-pyriform; intestine dilated at the commencement, afterwards cylindrical. Males were not seen.

131. *OXYURIS CURVULA* Rud.

Intestine of the horse, *Equus caballus*.

132. ? *OXYURIS DUBIA* Leidy. Body fusiform, curved. Head continuous with the body, naked. Mouth unarmed. Female generative aperture about the middle of the body. Tail abruptly narrowed, acutely conical. Length of female $1\frac{1}{2}$ lines, breadth $\frac{1}{4}$ of a line. Male not seen.

Found in the cæcum of *Bufo americanus*, and of *Salamandra rubra*.

✓ *SPIRONOURA* Leidy.

Body cylindroid, attenuated at the extremities. Head continuous with the body. Mouth round, surrounded by a circular papillated lip. Caudal extremity of male spiral, acute, tuberculate, with the two apicula of the penis curved, ensiform, costate; of the female conical, acute, with the generative aperture at the posterior third of the body.

133. *SPIRONOURA GRACILE* Leidy. Body of female incurved; that of male spiral posteriorly. Head naked; mouth with a circular lip of 6 papillæ. Tail of female long, calcarate, acute; of male, with two rows each of three tubercles. Spicula

of penis curved ensiform, costate, emarginate at the extremity. Length of female 8 lines, breadth $\frac{1}{2}$ of a line; length of male to 4 lines, breadth to $\frac{1}{2}$ of a line.

Found in the stomach of *Emys serrata*. Oesophagus long, pestle-form, gizzard globular, commencement of the intestine cordiform, rectum short, wide, pyriform. Ovaries double.

134. *SPIRONOURA AFFINE* Leidy. Body of female curved; that of male posteriorly spiral. Head naked; mouth with a circular lip of 67 papillæ. Tail of female nearly straight, moderately long, conical, acute; of the male, conical, incurved, with a pair of tubercles on each side near the end. Spicula of penis curved, ensiform, costate, acute. Length of female $4\frac{1}{2}$ lines, breadth one-fifth of a line; length of male 3 lines, breadth $\frac{1}{2}$ of a line.

Found in the cœcum of *Cistudo carolina*.

135. *PHYLAOPTERA TURBIDA* Rud.

Spiroptera Didelphis virginiana. Leidy, Pr. A. N. S., v, 155.

Common in the stomach of *Didelphis virginiana*. Found by Dr. Goddard, Mr. Schafhirt, and myself; and also by Mr. Jos. Jones, in Georgia.

136. *PHYLAOPTERA LINEATA* Leidy.

Spiroptera Scalopsis canadensis. Leidy, Pr. A. N. S., v, 156. The mouth bilabiate and surrounded by an elevated linear margin. Alæ of male, each with 4 diverging costæ. The length 6 lines, breadth $\frac{1}{2}$ of a line.

137. *PHYLAOPTERA MUCRONATA* Diesing.

Numerous specimens were obtained by Mr. Joseph Jones, from the stomach of the *Alligator mississippiensis*, in Georgia.

138. *PHYLAOPTERA CONSTRICTA* Leidy. Body white, with the brown intestine shining through, cylindrical to within a short distance of the extremities, incurved; anterior extremity with one or two constrictions, and abruptly inflexed. Lips large, lateral, constricted from the body, each trilobate. Tail of female incurved, abruptly conical and acute; of the male alated, with the alæ narrow, long, and turgid. Length of female $1\frac{1}{2}$ inches, breadth two-fifths of a line; male half the size.

Found frequently in the stomach of *Tropidonotus sipedon*, with the anterior extremity of the body hooked through the mucous membrane, and very tightly adhering by means of the one or two constrictions.

139. *PHYLAOPTERA CONTORTA* Leidy. Body capillary, most narrowed anteriorly, with the posterior four-fifths spirally contorted; white, with the intestine brown. Lips prominent, constricted from the body, trilobate. Tail short, conical, acute; in the male with narrow alæ, each furnished with five funnel-shaped pores. Length of female from 6 lines to an inch; breadth to $\frac{1}{2}$ of a line; male from one half to three-fourths the size.

Frequent in the stomach of *Emys serrata*, *Emys reticulata*, *Cistudo carolina*, and *Kinosternum pennsylvanicum*, adhering to the mucous membrane in the same manner as *Phyaloptera constricta*.

140. *PHYLAOPTERA ABSECTA* Leidy. Body most narrowed anteriorly, incurved. Mouth distinctly bilabiate; lips lateral, prominent. Caudal extremity incurved, obtusely conical. Length 10 lines, breadth $\frac{1}{2}$ a line.

One specimen was obtained by Mr. Jos. Jones, from the stomach of *Psemmophis flagelliformis*.

141. *CHEIRACANTHUS NORMEDUS* Leidy. Body subcylindrical, incurved, posteriorly sub-clavate, obtuse; anteriorly covered with palmate plates, furnished with as many as eight spines, and degenerating posteriorly to single spines. Head oblate-spheroidal, spirally echinate. Mouth bilabiate, with the lips lateral and papillated. Length of female $2\frac{1}{2}$ inches, breadth $1\frac{1}{2}$ lines. Male not seen.

Four specimens were obtained by Mr. Joseph Jones, in the stomach of the *Alligator mississippiensis* in Georgia.

142. *TRICOCEPHALUS DISPAR* Rud.

Not unfrequent in the children of the Anglo-american, and also in the negro.

143. *TRICOCEPHALUS MINUTUS* Rud.

Numerous specimens were obtained by Joseph Jones from the cœcum of *Didelphis virginiana* in Georgia.

144. *CUCULLANUS MICROCEPHALUS* Dujardin.

Cucullanus tripinosus Leidy, Pr. A. N. S., v, 240.

Frequent in the stomach and intestine of *Emys guttata*, *Emys reticulata*, *Emys serrata*, and *Chelonura serpentina*.

145. *CUCULLANUS ROSEUS* Leidy, Pr. A. N. S., v, 155. Body fusiform, sub-straight, red, anteriorly obtuse. Tail straight, short, conical, acute. Mouth with a complex corneous apparatus. Upper lip of anus turgid. Penis consisting of two calcarate spiculæ. Generative aperture of the female two-fifths the length of the body from the tail. Length of female to $1\frac{1}{2}$ inches, breadth to three-fifths a line; length of male to 10 lines, breadth $\frac{1}{2}$ a line.

From the intestine of *Testudo* ———? from Java.

146. *SCLEROSTOMUM DENTATUM* Rud.

Several specimens, male and female, were obtained from the liver of the hog, *Sus scrofa*.

147. *SCLEROSTOMUM SYNGANUS* Diesing.

Common in the trachea of the common fowl, *Phasianus gallus*.

148. *SCLEROSTOMUM ARMATUM* Rud.

Specimens preserved in the collection of the Academy, and presented by Dr. Harlan, who obtained them from an aneurism of the aorta of the horse, *Equus caballus*. *Strongylus armatus* Rud., Harlan Med. and Phys. Res. 553.

149. *STRONGYLUS ATTENUATUS* Leidy. Body cylindroid, narrowing towards the extremities; female nearly straight, male curved. Head obtuse, bialated; alæ long and moderately broad. Mouth, with minute angular papillæ. Tail of female straight, conical, acute. Bursa of the male bilobed, multiradiate. Length of female 6 lines, breadth one-fifth of a line; length of male $4\frac{1}{2}$ lines, breadth one-fifth of a line.

Sixteen specimens were obtained by Mr. Schafhirt from the intestine of *Cynocephalus porcarius*.

150. *STRONGYLUS SIMPLEX* Leidy. Body cylindroid, anteriorly rather abruptly narrowed; female straight; male curved, with the caudal extremity incurved. Head obtusely conical, not alated nor papillated. Tail of female compressed conical, acute; generative aperture one-third the length of the body from its extremity. Bursa of male trilobed? one lobe posterior and two lateral, multiradiate. Length of female 4 to 5 lines, breadth $\frac{1}{2}$ of a line; length of male $2\frac{1}{2}$ to $3\frac{1}{2}$ lines, breadth $\frac{1}{2}$ of a line.

Numerous specimens were obtained from the small intestine of *Hystrix dorsata*.

151. *STRONGYLUS AURICULARIS* Zeder.

Intestine of *Bufo americanus* and of *Cistudo carolina*.

152. *EUSTRONGYLUS GIGAS* Diesing.

Frequent in the kidneys of the mink, *Putorius vison*, and occasionally occurring in the dog, *Canis familiaris*. One specimen, eight inches long, was obtained by Mr. Joseph Jones from the heart of the latter animal, in association with *Filaria*, mentioned in another part of this paper.

153. *TRICHOSOMUM LINEARE* Leidy. Body filiform, nearly equally narrowed towards the extremities. Caudal extremity of the female spirally involute. Tail incurved, obtuse, with two conical points on the ventral aspect of the extremity. Caudal extremity of the male spiral; tail long, conical, acute; generative aperture a considerable distance from the end of the tail. Length of female 3 inches, breadth $\frac{1}{2}$ of a line; length of male $1\frac{1}{2}$ inches, breadth one-tenth of a line.

Seven specimens were obtained from the small intestine of the cat, *Felis catus*.

154. ?*TRICHOSOMUM PICORUM*. Body cylindroid, equally narrowed and acute at the two extremities. Mouth and anus terminal. Length of female 7 lines, breadth one-fifth of a line.

A single specimen was obtained by Mr. Schafhirt from the intestine of *Ficus colaris*.

155. *AGAMONEMA CAPSULARIA*? Diesing. Body slender, most narrowed anteriorly. Mouth small, circular, surrounded by an undivided lip. Tail short, obtusely conical, minutely mucronate. Length 5 to 10 lines, breadth from $\frac{1}{4}$ to $\frac{1}{2}$ of a line.

Found free in the intestine of *Centropristes nigricans*, *Clupea elongata*, and *Alosa sapidissima*. Also free in the intestine and pancreatic cæca of *Morrhua americana*; and larger specimens: 1 inch in length and $\frac{1}{2}$ of a line in breadth, coiled up within sacs of the peritoneum in the same fish.

156. *AGAMONEMA PAPILLIGERUM*? Diesing. Body cylindrical, most narrowed anteriorly, posteriorly obtusely conical. Mouth surrounded by four papillæ: anus terminal. Length to 4½ inches, breadth two-fifths of a line.

One specimen was obtained from the abdominal cavity of *Esox*.

157. *FILARIA MEDINENSIS* Gmelin.

Filaria hominis oris? Leidy, Pr. A. N. S., v, 117.

A specimen is preserved in the collection of the Academy, and was recently brought from Western Africa, by Dr. J. L. Burt, U. S. N., who obtained it from the leg of a white soldier.

158. *FILARIA PAPILLOSA* Rud.

Intestine of the ox, *Bos taurus*.

159. *FILARIA IMMITIS* Leidy.

Filaria Canis cordis Leidy, Pr. A. N. S., v, 118. Body cylindrical, obtusely rounded at the extremities. Mouth small, round, unarmed. Caudal extremity of male spiral, with a row of five tubercles and a narrow ala upon each side. Penis protruding a short distance above the anus. Length of female to 10 inches, breadth to $\frac{1}{2}$ a line; length of male to 5 inches, breadth $\frac{1}{2}$ of a line.

Mr. Joseph Jones recently presented to me two specimens of the heart of the dog, in the right ventricle of one of which there were five of the *Filaria* just described. In the other specimen, the right auricle and ventricle, and the pulmonary artery in its ramifications through the lungs are literally stuffed with *Filaria*. A portion of the blood of this dog, given to me by Mr. Jones, contains a great number of the young of the *Filaria*.

In relation to the symptoms which accompanied the presence of these worms in the heart while the dogs were living, Mr. Jones has furnished the following notes: The heart containing the five worms, was taken from a male pointer dog, whose appetite was voracious and insatiable, and notwithstanding he was abundantly supplied with food, he remained in a very lean condition. The heart and lungs containing great numbers of worms was from a cur dog, who was always so thin as to resemble a skeleton; and it was impossible to benefit his condition with the most liberal supply of food. Both dogs were of an exceedingly restless disposition. They did not die in consequence of the presence of the *Filaria*, but were killed in the course of some physiological experiments.

160. ?*FILARIA DUBIA* Leidy. Body cylindroid, narrowed towards the extremities, rolled in a transverse spiral. Head continuous with the body, naked. Mouth minutely papillated. Tail acute. Length 9 lines, breadth $\frac{1}{2}$ of a line.

Nine specimens were contained within two globular sacs of the gastric mucous membrane of the Albatross, *Diomedea exulans*, the preparation having been obtained in the South Atlantic, by Dr. W. S. W. Ruschenberger, U. S. N. The sacs also contained each a brown globular body about 3½ lines in diameter, divided by lines into quarters, intersected by transverse corrugations. At one pole of these enigmatic bodies was an elliptical aperture, and at the opposite pole a small conical tail-like appendage. (One of the bodies being cut open, ex-

hibited no regularity of structure. The *Filariae* were situated between the globular bodies and the walls of the sacs containing them.

161. *FILARIA ATTENUATA*? Rud. Body cylindrical, conical at the extremities. Head convex; mouth round, unarmed. Caudal extremity of male incurved. Tail short, obtusely conical. Length of female 4 inches, breadth $\frac{1}{4}$ of a line; length of male 2 inches, breadth one-fifth of a line.

Five specimens were obtained by Prof. Baird from the abdominal cavity of *Sturnella ludoviciana*.

Two female *Filariae* having the same form as the above, 5 inches in length and $\frac{1}{4}$ a line in breadth, were obtained by Prof. Baird from the adominal cavity of *Colaptes auratus*.

162. *FILARIA BISPINOSA* Diesing.

Filariae Boa constrictoris Leidy, Pr. A. N. S., v, 118.

Found beneath the skin of the *Boa constrictor*.

163. *FILARIA CISTUDINIS*. Body capillary, spirally involute, attenuated at the extremities. Head and tail obtusely rounded. Mouth unarmed. Anus terminal. Length $1\frac{1}{4}$ inches, breadth $\frac{1}{4}$ of a line.

One specimen was obtained by Mr. Schafhirt from the heart of *Cistudo carolina*.

164. *FILARIA AMPHIUMÆ*. Body cylindroid, attenuated towards the extremities, spirally coiled, anteriorly truncate, posteriorly acute. Length 6 lines, breadth one-fifth of a line.

Numerous specimens were found coiled up in the parietes of the stomach of *Amphiuma means*, the individual of which had been so long preserved in alcohol, that the characters of the worms could be partially determined only.

165. *FILARIA NITIDA* Leidy. Body filiform. Mouth large, round, unarmed; oesophagus one-fourth the length of the body; intestine straight, capacious, with a short narrow rectum; anus terminal with a short tubular prolongation. Tail sub-distinct, conical. Color red. Length to 5 lines, breadth one-twelfth of a line.

Found coiled up in oval cysts in the peritoneum and abdominal muscles of the *Rana pipiens*.

166. *FILARIA SOLITARIA* Leidy. Mouth transverse, sub-elliptical, papillated. Caudal extremity obtusely rounded. Anus terminal. Length to 2 inches, breadth $\frac{1}{4}$ of a line.

Coiled up in cysts between the tunics of the stomach and intestines of *Emys serrata* and *Chelonura serpentina*. Obtained by Mr. Joseph Jones, in Georgia.

167. *FILARIA RUBRA* Leidy. Capillary, anteriorly truncated, posteriorly obtusely conical, dark brownish red in color. Mouth transverse, slightly bilabiate; lips papillated. Anus terminal, transverse, crescentic. Length to $4\frac{1}{4}$ inches, breadth $\frac{1}{4}$ of a line.

Frequently found in considerable number in the peritoneal cavity of *Lebras lineatus*, during the winter.

168. *FILARIA QUADRITUBERCULATA* Leidy. Body capillary, red in color, anteriorly conical, unarmed; mouth circular, with an elevated, non-papillated, circular lip. Caudal extremity incurved, conical, ending in a minute conical papilla, and having on each side a pair of minute tubercles. Length 4 inches, breadth $\frac{1}{4}$ of a line.

A single specimen was found by Mr. Schafhirt in the muscles of the back of *Anguilla vulgaris*.

169. *GORDIUS VARIUS* Leidy.

Pr. A. N. S., v, 262, (1851).

Gordius aquaticus of American authors.

Gordius tricuspidatus? Siebold, Zeits. f. Wiss. Zool. vii, 143 (1855). Body long, linear, cylindrical, attenuated towards the extremities; narrowest anteriorly; passing through a variety of shades from a dusky yellowish white or

cream color, to a dusky ochreous yellow, yellowish brown, reddish brown, light chocolate to dark chocolate brown, or to ebony black; lustrous, often iridescent in sunlight. Head surrounded by a dark brown or black ring, obliquely truncated and terminated by a convex, translucent, whitish vesicular membrane, at the lower part of which is a minute round mouth. Integument areolated; areolæ irregularly pentahedral.

Female.—Lighter in color than the male, and usually much longer and thicker. Caudal extremity trifurcate; caudal lobes elongated, elliptical; one narrower than the other two. Generative aperture round, enclosed by the caudal lobes.

Male.—Usually dark-brown, often inclining to black. Caudal extremity curved. Tail bifurcate; caudal lobes curved conoidal, obtuse, divergent. Generative aperture ventral, just above the caudal lobes.

Twenty females and twelve males were found in Rancocas creek, a branch of the Delaware, New Jersey, in the month of August. Length of the former 5 to 12 inches; breadth $\frac{1}{2}$ to 2-5ths of a line. Length of the latter from 4 to 6 $\frac{1}{2}$ inches; breadth 1-5th to $\frac{1}{2}$ of a line. Three females from 7 to 12 inches in length, and from $\frac{1}{2}$ to 2-5ths of a line in breadth; and one male 6 $\frac{1}{2}$ inches in length and $\frac{1}{2}$ of a line in breadth, were obtained from the Delaware river. Six females and two males were obtained from the Schuylkill river. Mr. Pearsall has given me eight specimens from Philadelphia Co. Prof. Agassiz has given me a female 12 inches in length, from Niagara; a male 6 inches in length and a female 8 inches in length from the vicinity of Cambridge; two females 6 inches in length from Edgartown; and a male 3 inches in length, and 2 females 4 inches and 9 inches in length from Trenton. Dr. King, of Greensburg, Penn., has given me a male 5 inches in length, from his vicinity. Mr. Hazzard, of Point Judith, R. I., has given me a female 10 inches in length by 2-5ths of a line in breadth, from his vicinity. Prof. Kirtland has given me a male 5 inches in length, said to have been passed per annum by a girl, near Cleveland, Ohio. Prof. Baird has given me three males from the Susquehanna river, near Carlisle, Pa., and a male and female from Lake Champlain, N. Y.

The *Gordius varius* is the most common species of the genus in the United States; and it is familiar to most persons under the name of hair-worm, and is erroneously supposed to originate from the maceration of horse hairs in water. The species is remarkably prolific. A single female, 9 inches in length, by 2-5ths of a line in breadth, which I had preserved in a large vessel of water, extruded from between its caudal lobes, a cord of ova, broken into segments, the aggregate length of which was 91 inches, and breadth 1-20th of a line. I counted in each transverse disk of the cord, about 70 eggs, and in the length of 1-40th of an inch, 26 eggs, so that by simple calculation: $70 \times 26 \times 40 \times 91 =$ the whole number of eggs deposited is 6,624,800.

170. *GORDIUS AQUATICUS*? Gmelin.

Gordius seta Müller, Diesing, Syst. Helm. ii, 83.

Gordius lineatus Leidy, Pr. A. N. S., v, 263, (1851).

Gordius robustus? Leidy, Ibidem, 275. Body long, filiform, not narrowed anteriorly, dusky yellowish white, cream colored, white, light brown, or dark brown in color, sometimes darker at the extremities, lustrous. Areolæ of the integument hexagonal.

Female.—More robust than the male, opaque, and lighter colored. Head obtusely rounded. Caudal extremity truncated, rounded.

Male.—Narrower than the female. Head obtusely rounded. Caudal extremity incurved, bifurcated; caudal lobes curved conoidal, obtuse, imbricated upon the ventral border with simple branching dermal appendages.

Six males from 5 to 7 $\frac{1}{2}$ inches in length, and $\frac{1}{2}$ of a line in breadth; and one female 5 inches in length, by $\frac{1}{2}$ of a line in breadth; of a dusky yellowish white color, were obtained by Prof. Baird from a spring in Essex Co., New York, (*Gordius lineatus*, Pr. A. N. S., v, 263). One female, of a light brown color, with the head ringed with black, 3 $\frac{1}{2}$ inches long by 1-5th of a line broad, procured by Dr. W. S. Gibson, from a spring in Philadelphia county. A female of a cream-color, with the head ringed with dark brown, 4 $\frac{1}{2}$ inches long by 1-5th of

a line broad, I found in Frederick Brook, at the head of the Bay of Fundy, New Brunswick. A female (*G. robustus*, Pr. A. N. S., v, 275), hardly narrowed at the extremities, brown, rigid, with the head edged with dark brown, and the tail slightly expanded, conical and obtuse, $6\frac{1}{2}$ inches long, and $\frac{1}{2}$ a line wide, was obtained by Dr. Chas. H. Budd, from a boy, who informed him it had crept out of the abdomen of the specimen of grasshopper which accompanied the worm. A male and female were obtained by Mr. Schafhirt, from a single specimen of *Pterostichus fastidites* Dejean. The length of each is about 3 inches; the breadth of the male $\frac{1}{2}$ of a line, of the female $\frac{1}{2}$ of a line.

171. *MERMIS ALBICANS* Siebold.

Mermis elongata Leidy, Pr. A. N. S., v, 263.

Mermis crassicaudata Leidy, Ibidem.

Mermis ferruginea Leidy, Ib. Body long, capillary, narrowed towards the extremities, most narrowed anteriorly. Head slightly dilated or not at all, truncated, convex. Caudal extremity slightly curved, conoidal, obtuse. Color milk white when the worm is parasitic, or is buried in the earth; cream or yellowish white, or light ochreous yellow, or light reddish brown when it lives in water. In alcohol becomes translucent yellow, bright yellow, approaching to orange, or brown.

Eleven individuals (*Mermis elongata* Pr. A. N. S., v, 263,) of a dusky yellowish white, and from 6 to 18 inches long, by $\frac{1}{4}$ to $\frac{1}{2}$ of a line broad, were obtained by Dr. Chas. H. Budd, in the early spring season, in a ditch emptying into the Rancocas creek, New Jersey. Six specimens, opaque white in color, from 8 to 15 inches in length, were obtained by Samuel Powell, Esq., in digging in the earth mould of his garden at Newport, R. I. One specimen, of a cream color, 22 inches long and $\frac{1}{4}$ of a line broad, was obtained by Dr. William Gibson, from a rivulet in Philadelphia county. I found four specimens of a brownish white, from 9 to 16 inches long and from $\frac{1}{4}$ to $\frac{1}{2}$ of a line broad, in pools of fresh water, among the rocks of the sea shore of Point Judith, R. I. One specimen (*Mermis crassicaudata* Pr. A. N. S., v, 263,) opaque white, and 8 inches long, I found in a ditch below Philadelphia. A specimen (*Mermis ferruginea* Pr. A. N. S., v, 275,) from Brazil, contained in the collection of the Academy, is brown in color, and measures $14\frac{1}{2}$ inches long. A cream colored individual, 4 inches long and 1-5th of a line broad, was obtained from an apple by Major Le Conte, who, with great probability, supposed it had issued from the larva of a lepidopterous insect, in the core of the fruit. Professor Agassiz sent me a specimen translucent yellowish white in color, and $9\frac{1}{2}$ inches long, and 1-5th of a line wide, obtained from the abdomen of *Orchelimum gracile* Harris. Lastly, I have obtained specimens very frequently from *Locusta carolina*, of the meadows below Philadelphia, and occasionally from the earth and ditches in the same locality. From one to six of the worms occupy the body of a single insect, closely coiled among the viscera, from the head to the end of the abdomen. The worms are opaque white, and measure from 3 to 15 inches in length, and from $\frac{1}{4}$ to $\frac{1}{2}$ of a line in breadth. When the grasshoppers infested with these parasites are bruised, the worms creep out and penetrate into the earth, as I have satisfied myself by careful observation. In alcohol the *Mermis* of the grasshopper assumes in time a bright yellow hue.

172. *MERMIS ROBUSTA* Leidy.

Filaria Lycosæ Haldeman, Icong. Encyc. ii, Zool. 48. Body cylindrical, robust, rigid, smooth and shining, attenuated towards the extremities; most narrowed anteriorly. Head conical. Caudal extremity obtuse, imperforate.

I found one specimen, of a pale pinkish white, 3 inches in length, and $\frac{1}{4}$ of a line in breadth, which crept from the abdomen of a species of *Lycosa* with four stripes on the cephalothorax and three on the abdomen, from New Jersey. The specimen described by Mr. Haldeman, was pale reddish, and over five inches in length, by 2-5ths of a line in breadth, and was obtained from *Lycosa scutulata*? Hentz, in Pennsylvania.

Notices of some remains of extinct Mammalia, recently discovered by Dr. F. V. Hayden, in the bad lands of Nebraska.

By JOSEPH LEIDY, M. D.

1. *HIPPARION OCCIDENTALE*, Leidy.

This second American species of *Hipparion* is established on specimens of five superior and one inferior molar teeth, discovered by Dr. Hayden, on the White River of Nebraska. The internal isolated enamel column of the upper molars, on the worn crown, is elliptical and more than twice the length of the breadth. The central columns of the same teeth are comparatively moderately folded. Antero-posterior diameter of the first upper molar 15 lines, transverse diameter 10½ lines; antero-posterior diameter of the largest of the back upper molars 13 lines; transverse diameter 12 lines; smallest of the back upper molars 11 lines square. Antero-posterior diameter of the back inferior molar 12 lines, transverse diameter 7½ lines.

2. *HYOPOTAMUS AMERICANUS*, Leidy.

This species is founded upon a number of specimens of molar teeth, which were discovered by Dr. Hayden, in company with remains of *Titanotherium*, in Nebraska Territory. The teeth indicate a species of the same size as *Hyopotamus bovinus*, Owen. Among the specimens are the posterior two upper molars of both sides of the jaw from the same individual; and they present almost a repetition of form of the homologous pair of *H. vectianus*, Owen. The collection also contains two premolars in conjunction, apparently from the same individual as the true molar just mentioned. They correspond to the second and third premolars of *Anthracotherium*: the crown of the second premolar consisting of a single large trihedral lobe, with a tubercle at its postero-internal basal angle; and the crown of the third premolar being formed of a transverse pair of lobes, of which the outer one is trihedral and the inner one is smaller and conical. These premolars undoubtedly belong to the permanent dentition, and if they are not the second and third of the series, they are certainly the latter and the fourth. In either case, they confirm an opinion formerly expressed (*Anc. Fauna of Nebraska*, p. 45,) that the teeth represented by Prof. Owen, as the third and fourth permanent premolars of *Hyopotamus vectianus*, (*Lond. Quart. Journ. of the Geol. Soc.*, pl. vii, vol. iv.) really belong to the deciduous dentition; and, therefore, although *Hyopotamus* may not be identical with *Anthracotherium*, it is much more nearly allied to it than was suspected by its distinguished author.

The measurements of some of the molar teeth of *Hyopotamus americanus* are as follows:

Antero-posterior diameter of the superior last true molar, externally,	13½ lines.
Transverse do.	do. anteriorly, 15 do.
Antero-posterior diameter of the superior third premolar,	6 do.
Transverse do.	do. 8½ do.
Antero-posterior diameter of the superior second premolar,	10½ do.
Transverse do.	do. 8½ do.

Mr. Vaux, on behalf of the Publication Committee, presented the Annual Report, which was adopted.

ELECTION.

Mr. William P. Blake, of Washington, D. C., and B. A. Hoopes, Esq., of Eagle Harbor, Michigan, were elected *Correspondents*.



March 4th, 1856'

Vice-President BRIDGES in the Chair.

A letter was read from the American Antiquarian Society, dated Worcester, Mass., 29th Feb., 1856, acknowledging the receipt of vol. 7, of the Proceedings, and of the Journal, parts 1 and 2, vol. 8, n. s.

Also a letter from Mr. E. Billings, of Ottawa, Upper Canada, dated 26th Feb., 1856, acknowledging receipt of a copy of the Resolutions of the Academy adopted Feb. 19th last.

Dr. Leidy presented for publication two papers, entitled, "Descriptions of some remains of Fishes from the Carboniferous and Devonian formations of the United States;" and "Descriptions of some remains of Fossil Mammalia;" both of which were referred to the following Committee: Mr. Isaac Lea, Dr. Henderson and Dr. King.

March 11th.

Vice-President BRIDGES in the Chair.

Letters were read—

From S. Drinker, Esq., dated Canton, 28th Nov., 1855, transmitting donations to the Museum.

From Mr Edward Tuckerman, dated Amherst, Mass., March 1, 1856, offering for the acceptance of the Academy a collection of American plants.

Dr. Leidy presented for publication in the Proceedings, a paper by Drs. F. B. Meek and F. V. Hayden, entitled, "Descriptions of new species of Gasteropoda from the Cretaceous formations of Nebraska Territory;" which was referred to a Committee consisting of Mr. Lea, Dr. Leidy, and Dr. Wilson.

Dr. Leidy read the following extract from a letter recently received by Dr. J. McClellan from Mr. George Gibbs, Indian Agent, dated Fort Vancouver, Oregon, December 17, 1855.

"Let me point out to you one thing to be noted as regards skulls from this part of the country, which was brought to my notice by an article in Schoolcraft's book. I forget by whom. Among ten figures given are Chinook skulls *undattened*. Skulls from the region where that practice prevails, which are in the natural state, are those of slaves, and though possibly born among the Chinooks or other adjacent tribes, are of alien races. The characteristics must not be assumed therefore from these. The practice prevails, generally, from the mouth of the Columbia to the Dalles, about 180 miles, and from the Straits of Fuca on the North to Coos bay, between the 42d and 43d parallel south. Northward of the Straits it diminishes gradually to a mere slight compression, finally confined to women and abandoned entirely north of Milbank Sound. So east of the Cascade Mountains it dies out in like manner. Slaves are usually brought from the south, I should rather say were, for the foreign slave trade has ceased, though not the domestic (I am not talking of home politics), and the Klamath and Shaste tribes of California probably furnished many for this country, while captives from here were taken still north, and from Puget's Sound as far as the Russian possessions. The children of slaves were not allowed to flatten the skull, and therefore these round heads indicate, not the liberty-loving Puritan of the west, but the serf. I mention this because in minute comparisons it is

proper to take all precautions to insure genuineness. Skulls taken from large cemeteries, or from sepulchres of whatever form erected with care, may be deemed authentic, saving always the chance of intermarriage with distinct tribes, which is usual, because the bodies of slaves are left neglected in the woods. The Chinooks, for instance, preferring to buy wives from the Chihalis or Cowlitz, tribes of Sehlsh origin. If I get time to finish my general report this winter you will find further details, supposing always you are not tired of these. I have never been able to get an authenticated skull of a white half breed. These also are never flattened, the pride of intercourse in the mother preserving to the child the attributes of the superior race."

March 18th.

Vice-President BRIDGES in the Chair.

Letters were read—

From Signor A. Sauvalle, dated Havana, 10th Feb., 1856, transmitting donations to the Academy.

From Mr. Wm. P. Blake, dated Washington, 16th March, 1856, acknowledging receipt of his notice of election as a Correspondent.

Dr. Leidy presented a paper for publication from Dr. F. B. Meek and Dr. F. V. Hayden, entitled, "Descriptions of new species of Gastropoda and Cephalopoda from the Cretaceous formation of Nebraska Territory;" which was referred to Mr. Isaac Lea, Dr. Leidy, and Dr. Wilson.

Also a paper from Drs. B. F. Shumard and L. P. Yandell, entitled, "Notice of a new Fossil genus belonging to the Family Blastoida from the Devonian Strata near Louisville, Ky." Referred to Dr. Leidy, Mr. Rogers, and Mr. Lesley.

Also a paper entitled, "Notices of Remains of extinct Reptiles and Fishes, discovered by Dr. F. V. Hayden in the 'bad lands' on the Judith River, Nebraska Territory, by Joseph Leidy, M. D." Referred to Mr. Lesley, Dr. Le Conte, and Mr. I. Lea.

Dr. Leidy remarked that he had examined the specimen transmitted by Mr. Billings, of Ottawa, U. C. Upon removing the matrix he had discovered the hind legs of a young animal, which he believed to be a seal; but whether extinct or not he could not decide.

March 25th.

Vice-President BRIDGES in the Chair.

The Committee on papers by Dr. Leidy, entitled, "Descriptions of some remains of Fishes from the Carboniferous and Devonian formations of the United States;" and "Descriptions of some remains of extinct Mammalia," reported in favor of publication in the Journal of the Academy.

The Committees on Drs. Meek and Hayden's papers, read 11th and 18th inste.; on Dr. Leidy's, of 18th inst.; and on Dr. Shumard and Yandell's paper, read same date, reported in favor of publication in the Proceedings.

*Descriptions of new species of Gastropoda from the Cretaceous formations of Nebraska Territory.**

By F. B. MEEK AND F. V. HAYDEN, M. D.

The species indicated in the following paper comprise a portion of an extensive collection recently brought from Nebraska by one of the authors.† It is worthy of note that some of the species contained in the collection from the most recent Cretaceous beds of the upper Missouri country appear referable to genera which, according to high European authority, date no farther back than the true chalk, while many of them are closely analogous to Tertiary forms; so close indeed, that had they not been found associated in the same beds with Ammonites, Scaphites and other genera everywhere regarded as having become extinct at the close of the Cretaceous epoch, we would have considered them Tertiary species. If these beds really are equivalent to any portion of the Green sand of English geologists, it is a curious fact that we should find mingled together in them upper Cretaceous and Tertiary forms exactly as if they and those of the older Tertiary were deposited in the regular order of sequence. Such facts however are sometimes met with amongst Palæozoic formations.

The following section exhibits the order of superposition of the formations in which our Cretaceous fossils were found, and their relations to the Tertiary and older rocks.

Tertiary { Beds of clay, sandstone, lignite, &c., containing remains of vertebrata,
400 to and at places, vast numbers of plants, with land, fresh water, and
600 ft. sometimes marine or estuary mollusca.

Cretaceous system. { 5 } Gray and yellowish arenaceous clays containing great numbers of
 { marine mollusca with a few land plants. 100 to 150 feet.
 4 } Plastic clays with numerous marine mollusca. About 350 feet.
 3 } Gray and yellowish calcareous marl, containing *Ostrea congesta*, fish
 scales, &c. 100 to 150 feet.
 2 } Grayish and lead colored clays having few fossils. 80 feet.
 1 } Sandstones and clays not positively known to belong to the Cretaceous
 system. 90 feet.

Limestones of upper coal measures at Council Bluffs, containing *Spirifer* *Menschakanus*, *Allorisma terminalis*, *Terebratula subtilita*, *Fusulina cylindrica*, &c.

SCALARIA CERETHIFORMIS. Shell elongate-conical, turreted, not umbilicate; volutions seven or eight, convex, closely contiguous, traversed by numerous sharp, slightly curved costæ, less than the spaces between; surface marked by irregular lines of growth, crossed by fine, unequal, thread-like, revolving lines, as strong on the costæ as between them; suture distinct; aperture ovate, angular on the inner side above, rounded below; lip thin, curved outwards on the inner side below. Length 1.65 inches, breadth .73 inch; length of aperture .52 inch, breadth .40 inch; apical angle slightly convex, divergence about 28°.

Locality. Moreau trading post, No. 5 of the series, rare.

ACTEUS ACCELLIPTICUS. Shell elongate-oval or narrow elliptical; spire somewhat elevated; volutions about four; surface polished, and ornamented by about twenty-five regular revolving striae, composed of round puncta so disposed as to range up and down the shell exactly parallel to the obsolete lines of growth; suture distinct; aperture narrow, curved, acutely angular on the inner side above,

* Figures, comparisons, and remarks to be published hereafter.

† Dr. Hayden.

gradually widening downwards to about the middle, from which point it again very gradually contracts towards the narrowly rounded front; outer lip thin; columella having a single small oblique fold, outside of which there is a small umbilical groove. Length .25 inch, breadth .10 inch; apical angle regular, divergence 57°.

Locality and position. Crow Creek near Black hills. No. 4 of the series.

AVALANA SUBGLOBOSA. Shell globose or subovate; spire very short, slopes rounded; volutions four, increasing rapidly from the apex, last one very large and ventricose; surface ornamented by about thirty punctate striæ, half as wide as the elevations between on the upper part of the volutions, but much more closely crowded on the lower part of the last turn; suture linear, distinct; aperture semilunar, widest below, contracted and terminating in a smoothly rounded angle above; outer lip smooth within, faintly sinuate below and having a thick strong peristome without; inner lip thick and raised into a single prominent transverse tooth below. Length .39 inch, breadth .37 inch; length of aperture .21 inch, breadth .11 inch.

Locality and position. Moreau trading post. No. 5 of the series.

NATICA ? AMBIGUA. Shell obliquely suboval, or oblong; spire depressed-conical; volutions about four, convex, increasing somewhat rapidly from the apex, last one ventricose; surface marked by fine lines of growth and stronger parallel wrinkles, crossed by strong irregular revolving striæ; suture distinctly impressed, aperture obliquely ovate, angular above, rounded below; lips thin, apparently disunited above and abruptly deflected outward on the inner side below the small or rudimentary umbilicus. Length .50 inch, breadth .42 inch; length of aperture .34 inch, breadth of do. .24 inch; apical angle convex, divergence 81°.

Locality and position. Same as last.

NATICA OCCIDENTALIS. Shell obliquely-oval or ovate; spire elevated; volutions about five, convex; surface marked with fine lines of growth, and faint or nearly obsolete, minutely flexuous revolving lines; suture distinctly impressed; aperture ovate, straight on the inside and broadly rounded without; outer lip thin; inner lip not thickened, partly deflected over the edge of the small oblique umbilicus. Length about .97 inch, breadth .70 inch; length of aperture .56 inch, breadth .33 inch; apical angle convex, divergence 70°.

Locality and position. Same as preceding.

NATICA MOREAUVENSIS. Shell obliquely-ovate; spire somewhat depressed; volutions three and a half to four, convex, last one large and ventricose; surface marked by fine lines of growth, crossed by very fine, nearly obsolete, minutely flexuous revolving lines; suture distinctly impressed or sub-channeled; aperture ovate; outer lip thin; inner lip not thickened and deflected partly over the small umbilicus. Length about .90 inch, breadth .76 inch; length of aperture .54 inch, breadth .36 inch; apical angle slightly convex, divergence 90°.

Locality and position. Same as preceding.

TURBO NEBRASCENSIS. Shell turbinate, length and breadth about equal; spire broadly conical; volutions about five, rounded, gradually increasing from the apex; surface ornamented by fine revolving striæ, crossed by delicate lines of growth, becoming distinct oblique wrinkles along the suture and round the umbilicus, the whole presenting an elegant cancellated appearance under a lense; suture distinctly impressed; aperture round; umbilicus moderate, round. Length .25 inch, breadth .26 inch; diameter of aperture .12 inch; apical angle somewhat convex, divergence 53°.

Locality and position. Yellow Stone river, one hundred and fifty miles from mouth. No. 4 of series.

TURBO TENUILINEATUS. Shell oblong or suboval, oblique, thin; spire somewhat elevated, acute at the apex; volutions about five, rounded, increasing rapidly from the apex; last one ventricose, extended in front; surface marked

with distinct lines of growth, crossed by rounded, thread-like lines, generally less than the spaces between, and somewhat irregular in size; between the latter there are also very fine parallel revolving striae, only visible under a lens: suture apparently canaliculate; aperture broad ovate or oval; outer lip thin; inner lip straight above, and distinctly curved outwards below at its junction with the outer lip near the small umbilicus. Length .84 inch, breadth .68 inch; apical angle regular, divergence 78° ; length of aperture .50 inch, breadth of do. .36 inch.

Locality. Moreau trading post. No. 5 of the series.

ROSTELLARIA BIANGULATA. Shell elongated; spire elevated, acutely conical; volutions seven or eight, convex, crossed by small nearly obsolete folds, last one having two distinct revolving carinae on the middle, which diverge in passing upon the expanded lip, and terminate in two more or less salient angles at its outer margin; surface marked by fine very faint lines of growth, crossed by small revolving thread-like lines about equal the intermediate spaces, on the spire and upper part of the last turn, but more distinct and alternating with smaller ones on the lower part of the body volution; suture linear, sharply impressed; aperture unknown; outer lip thin, expanded, and extending more or less up the spire. Length .53 inch, breadth exclusive of the lip .21 inch; apical angle regular, divergence 37° .

Locality and position. Yellow Stone river, one hundred and fifty miles from mouth. No. 4 of the series.

FUSUS DAKOTAENSIS. Shell fusiform; spire conical, somewhat elevated; volutions about six, flattened or concave above, last one abruptly contracted into the canal below, and ornamented on the middle by two elevated revolving nodose carinae, between which faint, broadly rounded, vertical folds pass from node to node. On the spire only the upper and most prominent carina is seen, while a third less distinct parallel ridge passes round lower down on the body whorl; whole surface marked by fine, regular lines of growth, crossed by rounded revolving lines, one of which, about midway between the two large carinae, is stronger than the others; suture linear; aperture broad oval or ovate. Length from junction of canal and aperture to apex 1.03 inches, breadth .92 inch; length of aperture .48 inch, breadth .42 inch; apical angle regular, divergence 51° .

Locality and position. Moreau trading post. No. 5 of the series.

FUSUS GALPINIANUS. Shell small, fusiform; spire conical, acute; volutions five and a half to six, convex, last one sloping somewhat abruptly below into the short canal; surface marked by fine flexuous lines of growth, crossed by rounded little revolving bands or lines scarcely larger than the grooves between. About fourteen of these bands may be counted on the second volution; suture distinct; aperture narrow-oval, acutely angular behind, and sloping into the canal in front; outer lip thin and sharp; inner lip lying close upon the tortuous columella. Length 1.05 inches, breadth .42 inch; length of aperture (including canal) .53 inch, breadth .18 inch; apical angle regular or slightly convex, divergence 32° .

The above species is dedicated to Mr. C. E. Galpin, of Am. Fur Co.

Locality and position. Same as last.

FUSUS CUNEORETTUS. Shell obliquely fusiform; spire elevated conical, acute at the apex; volutions five and a half to six, distinctly concave above, convex below, and ornamented by indistinct flexuous folds, which swell out into a row of prominent nodes round the middle; last volution gradually contracting below into a short canal; surface marked by fine flexuous lines of growth crossed by numerous elevated thread-like revolving lines, a little less than the spaces between; suture distinct; aperture ovate, widest above the middle, angular behind, and tapering forward; outer lip thin; inner lip closely folded upon the somewhat tortuous columella. Length about .90 inch, breadth .48 inch; length of aperture and canal .56 inch, breadth .20 inch; apical angle convex, divergence 45° .

Locality. Same as the preceding.

FUSUS CULBERTSONI. Shell elongate fusiform; spire elevated conical, acute; volutions about seven, convex, increasing gradually from the apex, and crossed nearly at right angles to the suture by six or seven strong rounded folds, which gradually become obsolete on the last near the aperture; last volution tapering gracefully and obliquely into the canal, which is of moderate length; surface marked by irregular lines of growth, crossed by flattened or rounded lines, somewhat larger than the spaces between; suture distinctly impressed, and when viewed from above is seen to deviate from a regular curve in following the waving outline of the folds; aperture lanceolate or narrow oval, acutely angular above and tapering gradually below. Length about 1.68 inches, breadth .50 inch; length of aperture and canal about .90 inch, breadth .23 inch; apical angle convex, divergence 28°.

We dedicate this species to Mr. Alexander Culbertson, of the Am. Fur Co.

Locality and position. Same as preceding.

FUSUS FLEXUOCOSTATUS. Shell fusiform; spire somewhat elevated, acute at the apex; volutions six to six and a half, convex, traversed by strong, simple, flexuous folds nearly equalling the spaces between, and terminating above in small nodes so as to leave a shallow spiral groove below the suture; last whorl somewhat ventricose; surface ornamented by distinct lines of growth, crossed by small, elevated, thread-like, revolving lines, equal the spaces between on the upper part of the volutions, but more distant on the lower part of the last one; between the revolving lines and parallel with them, fine striæ may be seen by the aid of a magnifier; suture unknown; aperture oval or ovate. Length 1.05 inches, breadth .61 inch; length of aperture exclusive of canal .48 inch, breadth .30 inch; apical angle 46°.

Locality and position. Moreau river. No. 5 of series.

FUSUS NEWBERRYI. Shell fusiform, thick; spire conical; volutions five, flattened or concave above, convex below and ornamented round the middle with a row of more or less prominent nodes, which are sometimes prolonged on the last one into indistinct folds below; surface ornamented by irregular flexuous lines of growth, crossed by round, elevated, thread-like, revolving lines, sometimes greater and sometimes less than the spaces between; suture linear; aperture narrow ovate, angular above and scarcely distinct from the short canal below; outer lip thin or bevelled; inner lip closely spread upon the columella. Length 1.43 inches, breadth .81 inch; length of aperture (including the canal) .87 inch, breadth .32 inch; apical angle convex, divergence 55°.

We dedicate this species to Dr. J. S. Newberry, of Cleveland, Ohio.

Locality and position. Moreau river and Fox Hills. No. 5 of series.

PYRULA BAIRDI. Shell pyriform; spire depressed; volutions five, rapidly increasing from the apex, flattened or slightly concave above and on the outside; last one large and ventricose, ornamented on the outside by two to three more or less prominent, revolving, nodose carinae, only the upper of which is visible on the spire; surface marked by strong lines of growth, crossed by numerous elevated revolving lines, less than the spaces between, and sometimes assuming, on the outer and lower part of the last volution, the size of more distinct ridges; suture narrow, channeled; aperture ovate, abruptly contracted into the long canal below; columella tortuous, and deeply curved round the aperture; outer lip bevelled; inner lip thinly spread over the columella round the aperture, but leaving an umbilical groove about half way down the canal. Length 3.50 inches, breadth .2 inches; length of aperture (including the canal) .3 inches, breadth 1.08 inches; apical angle nearly regular, divergence 114°.

Dedicated to Prof. Spencer F. Baird, of the Smithsonian Institution.

Locality and position. Same as last.

FASCIOLARIA CRETACEA. Shell small elongate, fusiform; spire elevated conical; volutions five to six, convex, last one a little more than half the entire length of

the shell, contracted below into a tapering canal; surface marked with flexuous lines of growth and little flat revolving bands about four times as wide as the grooves between; suture distinct; aperture narrow oval, angular above and narrowing gradually below; columella tortuous and having five small, oblique folds near the middle of the aperture.

Locality and position. Same as preceding.

FASCIOLARIA BUCCINOIDES. Shell elongate-oval or subfusiform; spire conical, acute; volutions five to five and a half, convex, last one somewhat ventricose and contracted below into a short canal; surface ornamented with fine regular lines of growth and small parallel folds, which are crossed by regular, round, elevated revolving bands, equal to or greater than the spaces between. Of these bands about fourteen may be counted on the second volution; suture distinctly impressed; aperture narrow, oval, or semi-elliptical; outer lip faintly grooved, and at intervals of about once for each turn becomes thickened and crenulated on the inside; inner lip closely spread upon the tortuous columella, and forming about the middle of the aperture two distinct oblique folds. Length .96 inch, breadth .49 inch; length of aperture and canal about .60 inch, breadth .23 inch; apical angle convex, divergence 54°.

This shell has much the general appearance of a *Buccinum*, having the form and surface markings of *B. decussatum* (Lamk.) an Eocene species from the Paris basin, but differs from the genus *Buccinum* in having two distinct folds on the columella, being in this respect more like *Fasciolaria*. The folds on the columella are not stronger, however, than we see in *B. fusiformis* of Deshayes, another Tertiary species. We had once concluded to refer it with doubt to the genus *Buccinum*, but refer it to the genus *Fasciolaria*, at the suggestion of Dr. Gould, to whom we sent specimens. This genus, according to D'Orbigny, made its first appearance in the old world during the deposition of the true chalk.

Locality and position. Moreau and Fox Hills. No. 5 of the series.

BUCCINUM ? NEBRASCENSIS. Shell oval, thin; spire very short; volutions three to three and a half, convex, rapidly increasing from the apex, last one very large and somewhat ventricose; surface marked with distinct lines of growth, which are crossed by flattened, revolving bands, much wider on the upper part of the volutions than the shallow grooves between, but about equal to them on the lower part of the last turn. About seven or eight of these bands may be counted on the second volution; suture narrow, channeled; aperture large, sub-elliptical, angular above, and terminating in a rounded notch in front, the form of which is well defined by a sudden curve in the lines of growth on a broad spiral ridge round the outer edge of the pillar lip; outer lip very thin; inner lip thinly spread over the extremely tortuous columella. Length .77 inch, breadth .58 inch; length of aperture .61 inch, breadth .36 inch; apical angle convex, divergence 105°.

Being in doubt in regard to the generic relations of this shell, we sent specimens of it, and a few others, to the distinguished conchologist, Dr. Augustus A. Gould, of Boston, from whom we received in regard to it, the following remarks: "Its general form reminds one of *Natica*, and its revolving striæ of the subgenus *Natica*. If we look at the base, however, we find a revolving ridge which is never found in the *Naticidae*, but is peculiar to the *Buccinidae*." Dr. G. further remarks that with the exception of the revolving striæ it agrees very nearly with the genus *Psudoliva* of Swainson, which is not known to date back further than the Eocene. In many respects it resembles the Eocene *Buccinum obtusum* of Deshayes, from the Paris basin, which forms the type of an Eocene genus established by D'Orbigny under the name of *Sulco buccinum*. Our shell has the form, revolving striæ, &c., of some species of D'Orbigny's genus, but wants the strong revolving sulcus, which is one of its principal characters. For the present we refer it to the genus *Buccinum*, though we suspect it may form the type of a new genus.

Locality and position. Same as last.

a line broad, I found in Frederick Brook, at the head of the Bay of Fundy, New Brunswick. A female (*G. robustus*, Pr. A. N. S., v, 275), hardly narrowed at the extremities, brown, rigid, with the head edged with dark brown, and the tail slightly expanded, conical and obtuse, $6\frac{1}{2}$ inches long, and $\frac{1}{2}$ a line wide, was obtained by Dr. Chas. H. Budd, from a boy, who informed him it had crept out of the abdomen of the specimen of grasshopper which accompanied the worm. A male and female were obtained by Mr. Schafhirt, from a single specimen of *Pterostichus fastidius* Dejean. The length of each is about 3 inches; the breadth of the male $\frac{1}{2}$ of a line, of the female $\frac{1}{2}$ of a line.

171. *MERMIS ALBICANS* Siebold.

Mermis elongata Leidy, Pr. A. N. S., v, 263.

Mermis crassicaudata Leidy, Ibidem.

Mermis ferruginea Leidy, Ib. Body long, capillary, narrowed towards the extremities, most narrowed anteriorly. Head slightly dilated or not at all, truncated, convex. Caudal extremity slightly curved, conoidal, obtuse. Color milk white when the worm is parasitic, or is buried in the earth; cream or yellowish white, or light ochreous yellow, or light reddish brown when it lives in water. In alcohol becomes translucent yellow, bright yellow, approaching to orange, or brown.

Eleven individuals (*Mermis elongata* Pr. A. N. S., v, 263,) of a dusky yellowish white, and from 8 to 18 inches long, by $\frac{1}{4}$ to $\frac{1}{2}$ of a line broad, were obtained by Dr. Chas. H. Budd, in the early spring season, in a ditch emptying into the Rancocas creek, New Jersey. Six specimens, opaque white in color, from 8 to 15 inches in length, were obtained by Samuel Powell, Esq., in digging in the earth mould of his garden at Newport, R. I. One specimen, of a cream color, 22 inches long and $\frac{1}{4}$ of a line broad, was obtained by Dr. William Gibson, from a rivulet in Philadelphia county. I found four specimens of a brownish white, from 9 to 16 inches long and from $\frac{1}{4}$ to $\frac{1}{2}$ of a line broad, in pools of fresh water, among the rocks of the sea shore of Point Judith, R. I. One specimen (*Mermis crassicaudata* Pr. A. N. S., v, 263,) opaque white, and 8 inches long, I found in a ditch below Philadelphia. A specimen (*Mermis ferruginea* Pr. A. N. S., v, 275,) from Brazil, contained in the collection of the Academy, is brown in color, and measures $14\frac{1}{2}$ inches long. A cream colored individual, 4 inches long and 1-5th of a line broad, was obtained from an apple by Major Le Conte, who, with great probability, supposed it had issued from the larva of a lepidopterous insect, in the core of the fruit. Professor Agassiz sent me a specimen translucent yellowish white in color, and $9\frac{1}{2}$ inches long, and 1-5th of a line wide, obtained from the abdomen of *Orchelimum gracile* Harris. Lastly, I have obtained specimens very frequently from *Locusta carolina*, of the meadows below Philadelphia, and occasionally from the earth and ditches in the same locality. From one to six of the worms occupy the body of a single insect, closely coiled among the viscera, from the head to the end of the abdomen. The worms are opaque white, and measure from 3 to 15 inches in length, and from $\frac{1}{4}$ to $\frac{1}{2}$ of a line in breadth. When the grasshoppers infested with these parasites are bruised, the worms creep out and penetrate into the earth, as I have satisfied myself by careful observation. In alcohol the *Mermis* of the grasshopper assumes in time a bright yellow hue.

172. *MERMIS ROBUSTA* Leidy.

Filaria Lycosæ Haldeman, Icong. Encyc. ii, Zool. 48. Body cylindrical, robust, rigid, smooth and shining, attenuated towards the extremities; most narrowed anteriorly. Head conical. Caudal extremity obtuse, imperforate.

I found one specimen, of a pale pinkish white, 3 inches in length, and $\frac{1}{4}$ of a line in breadth, which crept from the abdomen of a species of *Lycosa* with four stripes on the cephalothorax and three on the abdomen, from New Jersey. The specimen described by Mr. Haldeman, was pale reddish, and over five inches in length, by 2-5ths of a line in breadth, and was obtained from *Lycosa scutulata*? Hentz, in Pennsylvania.

Notices of some remains of extinct Mammalia, recently discovered by Dr. F. V. Hayden, in the bad lands of Nebraska.

By JOSEPH LEIDY, M. D.

1. *HIPPARIUM OCCIDENTALE*, Leidy.

This second American species of *Hipparium* is established on specimens of five superior and one inferior molar teeth, discovered by Dr. Hayden, on the White River of Nebraska. The internal isolated enamel column of the upper molars, on the worn crown, is elliptical and more than twice the length of the breadth. The central columns of the same teeth are comparatively moderately folded. Antero-posterior diameter of the first upper molar 15 lines, transverse diameter 10½ lines; antero-posterior diameter of the largest of the back upper molars 13 lines; transverse diameter 12 lines; smallest of the back upper molars 11 lines square. Antero-posterior diameter of the back inferior molar 12 lines, transverse diameter 7½ lines.

2. *HYOPOTAMUS AMERICANUS*, Leidy.

This species is founded upon a number of specimens of molar teeth, which were discovered by Dr. Hayden, in company with remains of *Titanotherium*, in Nebraska Territory. The teeth indicate a species of the same size as *Hyopotamus brevius*, Owen. Among the specimens are the posterior two upper molars of both sides of the jaw from the same individual; and they present almost a repetition of form of the homologous pair of *H. vectianus*, Owen. The collection also contains two premolars in conjunction, apparently from the same individual as the true molar just mentioned. They correspond to the second and third premolars of *Anthracotherium*: the crown of the second premolar consisting of a single large tribedral lobe, with a tubercle at its postero-internal basal angle; and the crown of the third premolar being formed of a transverse pair of lobes, of which the outer one is tribedral and the inner one is smaller and conical. These premolars undoubtedly belong to the permanent dentition, and if they are not the second and third of the series, they are certainly the latter and the fourth. In either case, they confirm an opinion formerly expressed (*Anc. Fauna of Nebraska*, p. 45,) that the teeth represented by Prof. Owen, as the third and fourth permanent premolars of *Hyopotamus vectianus*, (*Lond. Quart. Journ. of the Geol. Soc.*, pl. vii, vol. iv,) really belong to the deciduous dentition; and, therefore, although *Hyopotamus* may not be identical with *Anthracotherium*, it is much more nearly allied to it than was suspected by its distinguished author.

The measurements of some of the molar teeth of *Hyopotamus americanus* are as follows:

Antero-posterior diameter of the superior last true molar, externally,	13½ lines.
Transverse do.	do. anteriorly, 15 do.
Antero-posterior diameter of the superior third premolar,	6 do.
Transverse do.	do. 8½ do.
Antero-posterior diameter of the superior second premolar,	10½ do.
Transverse do.	do. 8½ do.

Mr. Vaux, on behalf of the Publication Committee, presented the Annual Report, which was adopted.

ELECTION.

Mr. William P. Blake, of Washington, D. C., and B. A. Hoopes, Esq., of Eagle Harbor, Michigan, were elected *Correspondents*.

March 4th, 1856'

Vice-President BRIDGES in the Chair.

A letter was read from the American Antiquarian Society, dated Worcester, Mass., 29th Feb., 1856, acknowledging the receipt of vol. 7, of the Proceedings, and of the Journal, parts 1 and 2, vol. 8, n. s.

Also a letter from Mr. E. Billings, of Ottawa, Upper Canada, dated 26th Feb., 1856, acknowledging receipt of a copy of the Resolutions of the Academy adopted Feb. 19th last.

Dr. Leidy presented for publication two papers, entitled, "Descriptions of some remains of Fishes from the Carboniferous and Devonian formations of the United States;" and "Descriptions of some remains of Fossil Mammalia;" both of which were referred to the following Committee: Mr. Isaac Lea, Dr. Henderson and Dr. King.

March 11th.

Vice-President BRIDGES in the Chair.

Letters were read—

From S. Drinker, Esq., dated Canton, 28th Nov., 1855, transmitting donations to the Museum.

From Mr Edward Tuckerman, dated Amherst, Mass., March 1, 1856, offering for the acceptance of the Academy a collection of American plants.

Dr. Leidy presented for publication in the Proceedings, a paper by Drs. F. B. Meek and F. V. Hayden, entitled, "Descriptions of new species of Gastropoda from the Cretaceous formations of Nebraska Territory;" which was referred to a Committee consisting of Mr. Lea, Dr. Leidy, and Dr. Wilson.

Dr. Leidy read the following extract from a letter recently received by Dr. J. McClellan from Mr. George Gibbs, Indian Agent, dated Fort Vancouver, Oregon, December 17, 1855.

"Let me point out to you one thing to be noted as regards skulls from this part of the country, which was brought to my notice by an article in Schoolcraft's book. I forget by whom. Among ten figures given are Chinook skulls *squattened*. Skulls from the region where that practice prevails, which are in the natural state, are those of slaves, and though possibly born among the Chinooks or other adjacent tribes, are of alien races. The characteristics must not be assumed therefore from these. The practice prevails, generally, from the mouth of the Columbia to the Dalles, about 180 miles, and from the Straits of Fuca on the North to Coos bay, between the 42d and 43d parallel south. Northward of the Straits it diminishes gradually to a mere slight compression, finally confined to women and abandoned entirely north of Milbank Sound. So east of the Cascade Mountains it dies out in like manner. Slaves are usually brought from the south, I should rather say were, for the foreign slave trade has ceased, though not the domestic (I am not talking of home politics), and the Klamath and Shaste tribes of California probably furnished many for this country, while captives from here were taken still north, and from Puget's Sound as far as the Russian possessions. The children of slaves were not allowed to flatten the skull, and therefore these round heads indicate, not the liberty-loving Puritan of the west, but the serf. I mention this because in minute comparisons it is

proper to take all precautions to insure genuineness. Skulls taken from large cemeteries, or from sepulchres of whatever form erected with care, may be deemed authentic, saving always the chance of intermarriage with distinct tribes, which is usual, because the bodies of slaves are left neglected in the woods. The Chinooks, for instance, preferring to buy wives from the Chihalis or Cowlitz, tribes of Sehlsh origin. If I get time to finish my general report this winter you will find further details, supposing always you are not tired of these. I have never been able to get an authenticated skull of a white half breed. These also are never flattened, the pride of intercourse in the mother preserving to the child the attributes of the superior race."

March 18th.

Vice-President BRIDGES in the Chair.

Letters were read—

From Signor A. Sauvalle, dated Havana, 10th Feb., 1856, transmitting donations to the Academy.

From Mr. Wm. P. Blake, dated Washington, 16th March, 1856, acknowledging receipt of his notice of election as a Correspondent.

Dr. Leidy presented a paper for publication from Dr. F. B. Meek and Dr. F. V. Hayden, entitled, "Descriptions of new species of Gastropoda and Cephalopoda from the Cretaceous formation of Nebraska Territory;" which was referred to Mr. Isaac Lea, Dr. Leidy, and Dr. Wilson.

Also a paper from Drs. B. F. Shumard and L. P. Yandell, entitled, "Notice of a new Fossil genus belonging to the Family Blastoida from the Devonian Strata near Louisville, Ky." Referred to Dr. Leidy, Mr. Rogers, and Mr. Lesley.

Also a paper entitled, "Notices of Remains of extinct Reptiles and Fishes, discovered by Dr. F. V. Hayden in the 'bad lands' on the Judith River, Nebraska Territory, by Joseph Leidy, M. D." Referred to Mr. Lesley, Dr. Le Conte, and Mr. I. Lea.

Dr. Leidy remarked that he had examined the specimen transmitted by Mr. Billings, of Ottawa, U. C. Upon removing the matrix he had discovered the hind legs of a young animal, which he believed to be a seal; but whether extinct or not he could not decide.

March 25th.

Vice-President BRIDGES in the Chair.

The Committee on papers by Dr. Leidy, entitled, "Descriptions of some remains of Fishes from the Carboniferous and Devonian formations of the United States;" and "Descriptions of some remains of extinct Mammalia," reported in favor of publication in the Journal of the Academy.

The Committees on Drs. Meek and Hayden's papers, read 11th and 18th insts.; on Dr. Leidy's, of 18th inst.; and on Dr. Shumard and Yandell's paper, read same date, reported in favor of publication in the Proceedings.

*Descriptions of new species of Gastropoda from the Cretaceous formations of Nebraska Territory.**

BY F. B. MEEK AND F. V. HAYDEN, M. D.

The species indicated in the following paper comprise a portion of an extensive collection recently brought from Nebraska by one of the authors.† It is worthy of note that some of the species contained in the collection from the most recent Cretaceous beds of the upper Missouri country appear referable to genera which, according to high European authority, date no farther back than the true chalk, while many of them are closely analogous to Tertiary forms; so close indeed, that had they not been found associated in the same beds with *Ammonites*, *Scaphites* and other genera everywhere regarded as having become extinct at the close of the Cretaceous epoch, we would have considered them Tertiary species. If these beds really are equivalent to any portion of the Green sand of English geologists, it is a curious fact that we should find mingled together in them upper Cretaceous and Tertiary forms exactly as if they and those of the older Tertiary were deposited in the regular order of sequence. Such facts however are sometimes met with amongst Palaeozoic formations.

The following section exhibits the order of superposition of the formations in which our Cretaceous fossils were found, and their relations to the Tertiary and older rocks.

Tertiary	{	Beds of clay, sandstone, lignite, &c., containing remains of vertebrata, and at places, vast numbers of plants, with land, fresh water, and sometimes marine or estuary mollusca.
		400 to 600 ft.
		5 { Gray and yellowish arenaceous clays containing great numbers of marine mollusca with a few land plants. 100 to 150 feet.
		4 { Plastic clays with numerous marine mollusca. About 350 feet.
		3 { Gray and yellowish calcareous marl, containing <i>Ostrea congesta</i> , fish scales, &c. 100 to 150 feet.
		2 { Grayish and lead colored clays having few fossils. 80 feet.
Cretaceous system.	{	1 { Sandstones and clays not positively known to belong to the Cretaceous system. 90 feet.

Limestones of upper coal measures at Council Bluffs, containing *Spirifer Menchabianus*, *Allorisma terminalis*, *Terebratula subtilita*, *Fusulina cylindrica*, &c.

SCALARIA CERETHIFORMIS. Shell elongate-conical, turreted, not umbilicate; volutions seven or eight, convex, closely contiguous, traversed by numerous sharp, slightly curved costae, less than the spaces between; surface marked by irregular lines of growth, crossed by fine, unequal, thread-like, revolving lines, as strong on the costae as between them; suture distinct; aperture ovate, angular on the inner side above, rounded below; lip thin, curved outwards on the inner side below. Length 1.65 inches, breadth .73 inch; length of aperture .52 inch, breadth .40 inch; apical angle slightly convex, divergence about 28°.

Locality. Moreau trading post, No. 5 of the series, rare.

ACTEON ACCELLIPTICUS. Shell elongate-oval or narrow elliptical; spire somewhat elevated; volutions about four; surface polished, and ornamented by about twenty-five regular revolving striae, composed of round puncta so disposed as to range up and down the shell exactly parallel to the obsolete lines of growth; suture distinct; aperture narrow, curved, acutely angular on the inner side above,

* Figures, comparisons, and remarks to be published hereafter.

† Dr. Hayden.

gradually widening downwards to about the middle, from which point it again very gradually contracts towards the narrowly rounded front; outer lip thin; columella having a single small oblique fold, outside of which there is a small umbilical groove. Length .25 inch, breadth .10 inch; apical angle regular, divergence 57°.

Locality and position. Crow Creek near Black hills. No. 4 of the series.

AVALANA SUBGLOBOSA. Shell globose or subovate; spire very short, slopes rounded; volutions four, increasing rapidly from the apex, last one very large and ventricose; surface ornamented by about thirty punctate striae, half as wide as the elevations between on the upper part of the volutions, but much more closely crowded on the lower part of the last turn; suture linear, distinct; aperture semilunar, widest below, contracted and terminating in a smoothly rounded angle above; outer lip smooth within, faintly sinuate below and having a thick strong peristome without; inner lip thick and raised into a single prominent transverse tooth below. Length .39 inch, breadth .37 inch; length of aperture .21 inch, breadth .11 inch.

Locality and position. Moreau trading post. No. 5 of the series.

NATICA? AMBIGUA. Shell obliquely suboval, or oblong; spire depressed-conical; volutions about four, convex, increasing somewhat rapidly from the apex, last one ventricose; surface marked by fine lines of growth and stronger parallel wrinkles, crossed by strong irregular revolving striae; suture distinctly impressed, aperture obliquely ovate, angular above, rounded below; lips thin, apparently disunited above and abruptly deflected outward on the inner side below the small or rudimentary umbilicus. Length .50 inch, breadth .42 inch; length of aperture .34 inch, breadth of do. .24 inch; apical angle convex, divergence 81°.

Locality and position. Same as last.

NATICA OCCIDENTALIS. Shell obliquely-oval or ovate; spire elevated; volutions about five, convex; surface marked with fine lines of growth, and faint or nearly obsolete, minutely flexuous revolving lines; suture distinctly impressed; aperture ovate, straight on the inside and broadly rounded without; outer lip thin; inner lip not thickened, partly deflected over the edge of the small oblique umbilicus. Length about .97 inch, breadth .70 inch; length of aperture .56 inch, breadth .33 inch; apical angle convex, divergence 70°.

Locality and position. Same as preceding.

NATICA MOREAUENSIS. Shell obliquely-ovate; spire somewhat depressed; volutions three and a half to four, convex, last one large and ventricose; surface marked by fine lines of growth, crossed by very fine, nearly obsolete, minutely flexuous revolving lines; suture distinctly impressed or sub-channeled; aperture ovate; outer lip thin; inner lip not thickened and deflected partly over the small umbilicus. Length about .90 inch, breadth .76 inch; length of aperture .54 inch, breadth .36 inch; apical angle slightly convex, divergence 90°.

Locality and position. Same as preceding.

TURBO NEBRASCENSIS. Shell turbinate, length and breadth about equal; spire broadly conical; volutions about five, rounded, gradually increasing from the apex; surface ornamented by fine revolving striae, crossed by delicate lines of growth, becoming distinct oblique wrinkles along the suture and round the umbilicus, the whole presenting an elegant cancellated appearance under a lense; suture distinctly impressed; aperture round; umbilicus moderate, round. Length .25 inch, breadth .26 inch; diameter of aperture .12 inch; apical angle somewhat convex, divergence 53°.

Locality and position. Yellow Stone river, one hundred and fifty miles from mouth. No. 4 of series.

TURBO TENUILINEATUS. Shell oblong or suboval, oblique, thin; spire somewhat elevated, acute at the apex; volutions about five, rounded, increasing rapidly from the apex; last one ventricose, extended in front; surface marked

with distinct lines of growth, crossed by rounded, thread-like lines, generally less than the spaces between, and somewhat irregular in size; between the latter there are also very fine parallel revolving striae, only visible under a lens; suture apparently canaliculate; aperture broad ovate or oval; outer lip thin; inner lip straight above, and distinctly curved outwards below at its junction with the outer lip near the small umbilicus. Length .84 inch, breadth .68 inch; apical angle regular, divergence 78° ; length of aperture .50 inch, breadth of do. .36 inch.

Locality. Moreau trading post. No. 5 of the series.

ROSTELLARIA BIANGULATA. Shell elongated; spire elevated, acutely conical; volutions seven or eight, convex, crossed by small nearly obsolete folds, last one having two distinct revolving carinae on the middle, which diverge in passing upon the expanded lip, and terminate in two more or less salient angles at its outer margin; surface marked by fine very faint lines of growth, crossed by small revolving thread-like lines about equal the intermediate spaces, on the spire and upper part of the last turn, but more distinct and alternating with smaller ones on the lower part of the body volution; suture linear, sharply impressed; aperture unknown; outer lip thin, expanded, and extending more or less up the spire. Length .53 inch, breadth exclusive of the lip .21 inch; apical angle regular, divergence 37° .

Locality and position. Yellow Stone river, one hundred and fifty miles from mouth. No. 4 of the series.

FUSUS DAKOTAENSIS. Shell fusiform; spire conical, somewhat elevated; volutions about six, flattened or concave above, last one abruptly contracted into the canal below, and ornamented on the middle by two elevated revolving nodose carinae, between which faint, broadly rounded, vertical folds pass from node to node. On the spire only the upper and most prominent carina is seen, while a third less distinct parallel ridge passes round lower down on the body whorl; whole surface marked by fine, regular lines of growth, crossed by rounded revolving lines, one of which, about midway between the two large carinae, is stronger than the others; suture linear; aperture broad oval or ovate. Length from junction of canal and aperture to apex 1.03 inches, breadth .92 inch; length of aperture .48 inch, breadth .42 inch; apical angle regular, divergence 51° .

Locality and position. Moreau trading post. No. 5 of the series.

FUSUS GALPINIANUS. Shell small, fusiform; spire conical, acute; volutions five and a half to six, convex, last one sloping somewhat abruptly below into the short canal; surface marked by fine flexuous lines of growth, crossed by rounded little revolving bands or lines scarcely larger than the grooves between. About fourteen of these bands may be counted on the second volution; suture distinct; aperture narrow-oval, acutely angular behind, and sloping into the canal in front; outer lip thin and sharp; inner lip lying close upon the tortuous columella. Length 1.05 inches, breadth .42 inch; length of aperture (including canal) .53 inch, breadth .18 inch; apical angle regular or slightly convex, divergence 32° .

The above species is dedicated to Mr. C. E. Galpin, of Am. Fur Co.

Locality and position. Same as last.

FUSUS COSTARTUS. Shell obliquely fusiform; spire elevated conical, acute at the apex; volutions five and a half to six, distinctly concave above, convex below, and ornamented by indistinct flexuous folds, which swell out into a row of prominent nodes round the middle; last volution gradually contracting below into a short canal; surface marked by fine flexuous lines of growth crossed by numerous elevated thread-like revolving lines, a little less than the spaces between; suture distinct; aperture ovate, widest above the middle, angular behind, and tapering forward; outer lip thin; inner lip closely folded upon the somewhat tortuous columella. Length about .90 inch, breadth .48 inch; length of aperture and canal .56 inch, breadth .20 inch; apical angle convex, divergence 45° .

Locality. Same as the preceding.

FUSUS CULBERTSONI. Shell elongate fusiform; spire elevated conical, acute; volutions about seven, convex, increasing gradually from the apex, and crossed nearly at right angles to the suture by six or seven strong rounded folds, which gradually become obsolete on the last near the aperture; last volution tapering gracefully and obliquely into the canal, which is of moderate length; surface marked by irregular lines of growth, crossed by flattened or rounded lines, somewhat larger than the spaces between; suture distinctly impressed, and when viewed from above is seen to deviate from a regular curve in following the waving outline of the folds; aperture lanceolate or narrow oval, acutely angular above and tapering gradually below. Length about 1.68 inches, breadth .50 inch; length of aperture and canal about .90 inch, breadth .23 inch; apical angle convex, divergence 28°.

We dedicate this species to Mr. Alexander Culbertson, of the Am. Fur Co.

Locality and position. Same as preceding.

FUSUS FLEXUOCOSTATUS. Shell fusiform; spire somewhat elevated, acute at the apex; volutions six to six and a half, convex, traversed by strong, simple, flexuous folds nearly equalling the spaces between, and terminating above in small nodes so as to leave a shallow spiral groove below the suture; last whorl somewhat ventricose; surface ornamented by distinct lines of growth, crossed by small, elevated, thread-like, revolving lines, equal the spaces between on the upper part of the volutions, but more distant on the lower part of the last one; between the revolving lines and parallel with them, fine striae may be seen by the aid of a magnifier; suture unknown; aperture oval or ovate. Length 1.05 inches, breadth .61 inch; length of aperture exclusive of canal .48 inch, breadth .30 inch; apical angle 46°.

Locality and position. Moreau river. No. 5 of series.

FUSUS NEWBERRYI. Shell fusiform, thick; spire conical; volutions five, flattened or concave above, convex below and ornamented round the middle with a row of more or less prominent nodes, which are sometimes prolonged on the last one into indistinct folds below; surface ornamented by irregular flexuous lines of growth, crossed by round, elevated, thread-like, revolving lines, sometimes greater and sometimes less than the spaces between; suture linear; aperture narrow ovate, angular above and scarcely distinct from the short canal below; outer lip thin or bevelled; inner lip closely spread upon the columella. Length 1.43 inches, breadth .81 inch; length of aperture (including the canal) .87 inch, breadth .32 inch; apical angle convex, divergence 55°.

We dedicate this species to Dr. J. S. Newberry, of Cleveland, Ohio.

Locality and position. Moreau river and Fox Hills. No. 5 of series.

PYRULA BAIRDI. Shell pyriform; spire depressed; volutions five, rapidly increasing from the apex, flattened or slightly concave above and on the outside; last one large and ventricose, ornamented on the outside by two to three more or less prominent, revolving, nodose carinae, only the upper of which is visible on the spire; surface marked by strong lines of growth, crossed by numerous elevated revolving lines, less than the spaces between, and sometimes assuming, on the outer and lower part of the last volution, the size of more distinct ridges; suture narrow, channeled; aperture ovate, abruptly contracted into the long canal below; columella tortuous, and deeply curved round the aperture; outer lip bevelled; inner lip thinly spread over the columella round the aperture, but leaving an umbilical groove about half way down the canal. Length 3.50 inches, breadth .2 inches; length of aperture (including the canal) .3 inches, breadth 1.08 inches; apical angle nearly regular, divergence 114°.

Dedicated to Prof. Spencer F. Baird, of the Smithsonian Institution.

Locality and position. Same as last.

FASCIOLARIA CRETACEA. Shell small elongate, fusiform; spire elevated conical; volutions five to six, convex, last one a little more than half the entire length of

the shell, contracted below into a tapering canal; surface marked with flexuous lines of growth and little flat revolving bands about four times as wide as the grooves between; suture distinct; aperture narrow oval, angular above and narrowing gradually below; columella tortuous and having five small, oblique folds near the middle of the aperture.

Locality and position. Same as preceding.

FASCIOLARIA BUCCINOIDES. Shell elongate-oval or subfusiform; spire conical, acute; volutions five to five and a half, convex, last one somewhat ventricose and contracted below into a short canal; surface ornamented with fine regular lines of growth and small parallel folds, which are crossed by regular, round, elevated revolving bands, equal to or greater than the spaces between. Of these bands about fourteen may be counted on the second volution; suture distinctly impressed; aperture narrow, oval, or semi-elliptical; outer lip faintly grooved, and at intervals of about once for each turn becomes thickened and crenulated on the inside; inner lip closely spread upon the tortuous columella, and forming about the middle of the aperture two distinct oblique folds. Length .96 inch, breadth .49 inch; length of aperture and canal about .60 inch, breadth .23 inch; apical angle convex, divergence 54°.

This shell has much the general appearance of a *Buccinum*, having the form and surface markings of *B. decussatum* (Lamk.) an Eocene species from the Paris basin, but differs from the genus *Buccinum* in having two distinct folds on the columella, being in this respect more like *Fasciolaria*. The folds on the columella are not stronger, however, than we see in *B. fusiformis* of Deshayes, another Tertiary species. We had once concluded to refer it with doubt to the genus *Buccinum*, but refer it to the genus *Fasciolaria*, at the suggestion of Dr. Gould, to whom we sent specimens. This genus, according to D'Orbigny, made its first appearance in the old world during the deposition of the true chalk.

Locality and position. Moreau and Fox Hills. No. 5 of the series.

BUCCEUM ? NEBRASCENSIS. Shell oval, thin; spire very short; volutions three to three and a half, convex, rapidly increasing from the apex, last one very large and somewhat ventricose; surface marked with distinct lines of growth, which are crossed by flattened, revolving bands, much wider on the upper part of the volutions than the shallow grooves between, but about equal to them on the lower part of the last turn. About seven or eight of these bands may be counted on the second volution; suture narrow, channeled; aperture large, sub-elliptical, angular above, and terminating in a rounded notch in front, the form of which is well defined by a sudden curve in the lines of growth on a broad spiral ridge round the outer edge of the pillar lip; outer lip very thin; inner lip thinly spread over the extremely tortuous columella. Length .77 inch, breadth .58 inch; length of aperture .61 inch, breadth .36 inch; apical angle convex, divergence 105°.

Being in doubt in regard to the generic relations of this shell, we sent specimens of it, and a few others, to the distinguished conchologist, Dr. Augustus A. Gould, of Boston, from whom we received in regard to it, the following remarks: "Its general form reminds one of *Natica*, and its revolving striæ of the subgenus *Natica*. If we look at the base, however, we find a revolving ridge which is never found in the *Naticidae*, but is peculiar to the *Buccinidae*." Dr. G. further remarks that with the exception of the revolving striæ it agrees very nearly with the genus *Pseudolita* of Swainson, which is not known to date back further than the Eocene. In many respects it resembles the Eocene *Buccinum obtusum* of Deshayes, from the Paris basin, which forms the type of an Eocene genus established by D'Orbigny under the name of *Sulco buccinum*. Our shell has the form, revolving striæ, &c., of some species of D'Orbigny's genus, but wants the strong revolving sulcus, which is one of its principal characters. For the present we refer it to the genus *Buccinum*, though we suspect it may form the type of a new genus.

Locality and position. Same as last.

CAPULUS FRAGILIS. Shell broadly conical, very thin; apex elevated, central; slopes slightly convex, divergence 80° ; surface marked with fine, closely arranged, concentric striae; aperture circular. Diameter of base 1.22 inch; height of apex about .74 inch.

It is with some doubt we refer this species to the above genus, as our specimen only consists of an internal cast with a few fragments of shell adhering; no muscular impressions are visible upon it, but the nipple at the summit appears to have occupied the interior of an attenuated and laterally curved apex.

Locality and position. Fox Hills. No. 5 of the series.

Genus *HELICION* (Montfort).

We have not yet had an opportunity of seeing the interior of any of the following patelliform shells, but, judging from external characters, they appear referable to the above genus as defined by D'Orbigny. They are all strictly symmetrical, with, as far as can be ascertained, thin, smooth, and nearly, if not quite entire borders.

HELICION SEXSULCATUS. Shell patelliform, longer than wide; apex between the centre and anterior margin depressed; lateral slopes nearly straight, divergence 100° ; anterior slope slightly concave, and having two broad shallow grooves radiating from the apex to the antero-lateral edges; posterior slope convex, and having four broad shallow grooves radiating from the apex to the posterior and lateral edges; base or aperture oval; surface unknown. Length unknown, breadth about 1.29 inch, height .48 inch.

Locality and position. Yellow Stone, one hundred and fifty miles from mouth. No. 4 of the series.

HELICION PATELLIFORMIS. Shell patelliform, thin, a little longer than wide; apex somewhat elevated, nearer the centre than the anterior margin; lateral slopes nearly straight, divergence about 90° ; anterior slope straight or slightly concave, posterior convex, divergence of the two about 103° ; surface marked with fine concentric lines of growth, which are crossed by very faint indications of fine radiating striae, and on the anterior side by three or four scarcely perceptible, radiating carinae (the latter not always present); aperture broad, oval. Length 1 inch, breadth .84 inch, height .44 inch.

Locality and position. Same as last.

HELICION ALVEOLUS. Shell patelliform, thin, longer than wide; apex depressed, nearly central; lateral slopes convex and forming an angle of 80° ; posterior and anterior slopes about equally convex, divergence 120° ; surface marked with very fine concentric lines of growth; base or aperture elliptical or subovate, Length .63 inch, breadth .43 inch, height .17 inch.

Locality and position. Yellow Stone river. No. 4 of series.

HELICION SUBOVATUS. Shell patelliform, longer than wide; apex depressed, situated about half way between the centre and the anterior margin; lateral slopes convex, and forming an angle of 80° ; posterior slope more convex than the anterior, divergence of the two 104° ; surface marked by faint, irregular, concentric undulations and imbricating lines of growth; base or aperture oval or subovate, extremities broadly rounded, the posterior end being a little wider than the anterior. Length 1.16 inches, breadth .81 inch, height .39 inch

Locality and position. Same as preceding.

HELICION CARINATUS. Shell very obliquely conical or bonnet-shaped, thin; apex elevated near the anterior margin, and directed forward; anterior and antero-lateral slopes profoundly concave; posterior slope convex above and flattened or concave below. A single strong, rounded carina passes from the apex down the posterior slope, becoming gradually obsolete near the margin, while two or three much fainter ones radiate from the apex down the postero-

lateral slopes on each side of it. Six small indistinct striae radiate from the apex, two of which are directed forwards and outwards, and four backwards and outwards; faint, irregular, concentric undulations dimly indicate the progressive stages of growth; surface otherwise smooth; aperture circular. Diameter of aperture 1.93 inches, height of apex .80 inch.

Locality and position. Same as preceding.

DENTALIUM FRAGILE. Shell very thin, slender, gently curved from apex to base; surface ornamented by rounded, thread-like, longitudinal lines, which are crossed somewhat obliquely upwards from the inner to the outer side of the curve by very fine regular lines of growth. The longitudinal lines terminate abruptly a little below the apex, (where they number about fourteen) and increase in number by implantation, and diminish in size and regularity towards the larger end, so as to become nearly obsolete on the lower half of the shell; aperture circular. Diameter at the apex .03 inch, do. of a fragment .85 inch, below apex .13 inch, do. of largest fragment .19 inch; thickness of shell .02 inch; apical angle 3°.

The above species is closely allied to *D. gracilis*, Hall and Meek, (vol. 5, new series, Trans. Acad. Arts and Sciences, Boston) but differs in having much less prominent longitudinal striae, and not more than half as thick a shell; while the aperture, which in the former is nearly always subcircular, in the present species is exactly circular.

Locality and position. Yellow Stone river, one hundred and fifty miles above mouth. No. 4 of section.

BELLA VOLVARIA. Shell narrow ovate, tapering gradually from below the middle upwards, and extended obliquely below; spire hidden, sometimes umbilicate; surface ornamented by faint lines of growth and shallow revolving striae, about one fifth as wide as the spaces between on the middle of the shell, but more closely crowded and irregular at the lower and upper extremities. Occasionally a much finer stria occupies one of the spaces between the others; aperture long, narrow, gently curved, rising above the summit of the body, about half as wide above the middle as below; lip thin, closely folded over the rudimentary umbilicus. Length .66 inch, breadth .36 inch.

Locality and position. Moreau trading post. No. 5 of section.

BELLA MINOR. Shell minute, ovate, or elliptical; spire hidden, umbilicate; surface marked by elevated, sharp, revolving striae, about equal to the grooves between; fine sharply elevated lines of growth, more distinct in the grooves than on the elevations, mark the surface in the other direction; aperture large, rising above the summit of the body, narrow and obtuse above, and widening gradually below. Length about .10 inch, breadth .05.

Locality and position. Moreau trading post. No. 5 of the series.

BELLA OCCIDENTALIS. Shell oval or ovate, thin, ventricose, widest a little above the middle, rounded at the summit and somewhat obliquely extended in front; spire hidden, umbilicate; surface unknown. Indistinct lines of growth, and stronger revolving striae less than the spaces between are seen on the cast; aperture curved, narrow behind, rising above the summit of the body, and widening chiefly on the inner side below; lip slightly curved outwards round the lower part of the aperture. Length .44 inch, breadth .28 inch.

Locality and position. Yellow stone river. No. 4 of the series.

We have other new species of Gasteropoda from the Cretaceous formations of the upper Missouri, but refrain from indicating them out of deference to friends having specimens of the same which they wish to describe.

Descriptions of new species of Gastropoda and Cephalopoda from the Cretaceous formations of Nebraska Territory.

By F. B. MEEK and F. V. HAYDEN, M. D.

TURRITELLA CONVEXA. Shell acutely conical; volutions flattened convex; suture linear, indistinct; surface marked with fine lines of growth; aperture ovate, acutely angular above, rounded below. Length unknown; breadth of largest specimen .39 inch; apical angle very convex, divergence 20° .

This species may at once be distinguished from any other shell known to us from this region, by the convexity of the lateral slopes of the spire, and the absence of revolving lines.

Locality and position. Yellow Stone river, one hundred and fifty miles from mouth. No. 4 of the series.

TURRITELLA MOREAUCENSIS. Shell terete; spire elevated; volutions (number unknown) flattened, increasing very gradually from the apex, and ornamented by elevated thread-like revolving bands or lines about equal the intermediate spaces; while sharply elevated, regular, and somewhat distant, lines of growth traverse the whorls in the other direction: suture linear and sharp; aperture subquadrate, forming nearly a right angle on the inner side above, and terminating in a distinct notch on the columellar side below. Length (unknown,) breadth .10 inch; length of aperture .07 inch, breadth .04 inch; apical angle regular, divergence 9° .

We have only incomplete specimens of this species, consisting of from six to eight volutions, of which there were probably not less than ten. On the last whorl, there is a fourth smaller revolving line below the others, and still lower, several very fine revolving striae. The lines of growth, are much more distinct between, than upon the revolving lines on all parts of the shell.

Locality and position. Moreau river. No. 5 of the series.

BELMNTITELLA? EGBLOSA. Shell elongated, cylindrical, widening at the opening, then somewhat contracted, and again enlarging below the middle, whence it gradually tapers to a point; alveolus having a small groove down the dorsum, and marks of transverse septa round the sides; substance of the shell fibrous,—fibers radiating at nearly right angles from the central linear axis to the exterior. Phragmacone tapering regularly at an angle of 20° from the larger extremity to the apex, where it terminates in a minute but distinct bulb-like expansion; section circular or broad oval, septa faintly sinuate on the dorsum and separated by spaces equalling about one-sixth the diameter of the shell; about twenty-eight of the septa may be counted in the space of half an inch from the apex. Length unknown; diameter of largest fragment .33 inch.

We have of this species perfect specimens of the phragmacone, but having only seen longitudinal sections, and worn fragments of the external horny shell, we know nothing of its surface markings, nor whether or not it possessed the longitudinal slit characteristic of the genus. The groove down the inner side of the alveolar cavity, however, is well marked in some of the fragments. We were at first inclined to refer it with doubt to *Belmntitella mucronata* (D'Orb.) which has already received such a multiplicity of names, but a careful comparison with authentic specimens of that species from New Jersey convinces us it is different, and may be at once distinguished by the small bulb at the apex of the phragmacone, which always leaves its impression at the point of the alveolar cavity. So far as we know, this genus is, in the old world, confined to the true chalk.

Locality and position. Moreau river. No. 5 of the series.

AMMONITES HALLI.—Shell large, laterally compressed, rounded on the dorsum; umbilicus rather small, deep, somewhat funnel shaped, exhibiting one-third to one-fourth, of each of the inner volutions; surface ornamented by numerous small, slightly elevated, costae, which cross the volutions more or less obliquely. About one-fourth of those crossing the dorsum reach the umbilicus,

around which on the outer whorl, they swell out into a row of prominent transversely elongated nodes or ridges, while the intermediate ones die out, or coalesce with the others at various distances across from the periphery.

Septa profoundly lobed, and exceedingly complicated. All the margins of the branches of the lobes, sharply, and those of the saddles obtusely, digitate. Dorsal lobe ornamented at the extremity with four principal branches, the two terminal of which are larger than the others, and again divided into two branchlets. Dorsal saddle much larger than the superior lateral lobe, inequally divided at the summit by the slender digitate auxiliary lobe into two branches, that on the dorsal side being much larger than the other, and again once or twice deeply divided. Superior lateral lobe much smaller than the dorsal saddle, and having four principal divisions, the two terminal of which are greatly larger than the others, and each again divided into two branchlets, of which the two lateral are much smaller than the others. Superior lateral saddle a little smaller than the superior lateral lobe, deeply divided at the summit into two nearly equal branches, each of the divisions being again divided into two or three parts. Inferior lateral lobe small and slender, having four or five alternating branches. The succeeding lobes are very small and simply bifid or trifid at the extremity.

It is exceedingly difficult, if not impossible, from our imperfect specimens, to determine definitely whether this is *Scaphite* or an *Ammonite*, though we are inclined, in consequence of its large size, to think it must be the latter. Our description is made out from a young shell measuring four and a half inches across the disc, while we have fragments of other individuals which must have been at least four times as large; hence we infer, in adult shells of large size, the lobes of the septa may have been even more complicated than those of the specimen investigated by us.

From the same bed we have a large distorted specimen, apparently of the same species, which is less compressed and has stronger costæ. It also appears to want the row of nodes round the umbilicus. As far as we have been able to see its septa, they appear to be identical with those of the above species; consequently we are disposed, at present, to regard it as only a variety of the same. It is possible, however, a careful comparison of better specimens may prove them to be distinct; if so, we would propose for it the specific name of *amplus*.

This species is named after Prof. James Hall, of Albany, N. Y.

Locality and position. Yellow-stone River, one hundred and fifty miles above the mouth, and one hundred and fifty miles above Milk River, No. 4 of series.

ANCYLOCERAS? NEBRASCENSIS. Of this species we have but a fragment, about two inches in length. It makes a short spiral curve like *Helioceras* (D'Orb.) and is ornamented with small (bifurcating?) annular costæ, more distinct on the ventral than dorsal side. The specimen is too imperfect to show the details of the lobes, though we can see they are very complicated, and sharply digitate. Section circular, diameter .90 inch.

This and the following species would not go into the genus *Ancyloceras*, as defined by D'Orbigny, but appear to be closely related to forms, so referred by Pictet and others.

Locality. Iguor creek, north fork, Cheyenne. *Position.* No. 4 of the series.

ANCYLOCERAS? CHEYENENSIS. The only specimen of this species we have seen, is a section of the outer chamber, about two and a half inches long. It makes a broad spiral curve, and is ornamented by prominent rounded annular costæ, which encircle the shell very obliquely, and are smaller and more approximate on the inner side of the curve, than without. Costæ having two prominent nodes, at which point they sometimes bifurcate; the nodes being so arranged as to form two parallel rows up and down the dorso-lateral portion of the shell. Section circular, diameter 2.40 inches.

The above species resembles somewhat *Ancyloceras? Nicolletij* of Hall and Meek (Vol. 5, new series, Trans. Am. Acad. Arts and Sciences, Boston,) but has much larger and more prominent costæ, which pass less obliquely round the shell, and do not bifurcate so frequently, while the nodes are larger, and the curve of the

shell much broader. From *Ancyloceras? aproximans*, Con. (Proceedings of the Phila. Acad. p. 266,) it differs in having broadly rounded, instead of acute costæ.

Locality and position. Mouth Cheyenne river. No. 4. of series.

Notices of remains of extinct Reptiles and Fishes, discovered by Dr. F. V. Hayden in the Bad Lands of the Judith River, Nebraska Territory.

By JOSEPH LEIDY, M. D.

1. *PALÆOSCINCUS COSTATUS*, Leidy.

The genus and species are founded on a single specimen of a tooth of a lacertian, discovered by Dr. Hayden.

The crown of the tooth is palmate, with eight radiating costæ terminating at the margin in more or less developed points. The fang is flattened cylindrical, and is hollow; and it expands into a ridge surrounding the base of the crown. Breadth of the crown 4 lines, length $2\frac{1}{2}$ lines; width of the fang 2 lines, thickness 1 line. Whole length of the specimen 4 lines.

2. *TRACHODON MIRABILIS*, Leidy.

The genus and species are founded upon specimens of teeth, generally very much worn and in a fragmentary condition, of a herbivorous lacertian reptile allied to the *Iguanodon*, discovered by Dr. Hayden.

One of the specimens of teeth is an unworn crown, about 14 lines long and 5 lines in diameter at its thickest part. It has the form of a slightly bent hexahedral column, bevelled off convexly from the summit of the tooth internally to the base externally. The outer surface is smooth, and has a prominent median ridge and prominent subacute lateral borders. The inner surface of the tooth, presenting the five smaller sides of the column, is quite roughened with irregular granulations. The base of the tooth is hollow, and its walls at the broken border of the specimen are $1\frac{1}{2}$ lines thick.

In another and much worn specimen of a tooth, which had apparently been shed, and is now $4\frac{1}{2}$ lines long; the triturating surface is slightly concave and pentahedral, with concave sides, and is 4 lines in diameter. The two portions of the outer surface incline much more from the median ridge than in the preceding specimen; and the base of the tooth is hollowed, apparently from the pressure of a successor.

3. *TROODON FORMOSUS*, Leidy.

The genus and species are founded on a single specimen of a tooth of a lacertian, discovered by Dr. Hayden.

The specimen consists of a compressed, curved, conical crown with trenchant edges. The outer side is more convex than the inner, which is worn off towards the apex from friction of the opposing tooth. The trenchant edges are coarsely denticulated; the denticulations themselves being compressed conical, with trenchant edges, and are bent in such a manner that their apices are directed towards the summit of the crown. The base of the tooth is hollow, and is 2 lines wide and $1\frac{1}{2}$ lines transversely; and the length of the specimen is 3 lines.

4. *DEINODON HORRIDUS*, Leidy.

This genus and species are founded on a number of specimens, consisting of fragments of teeth of a saurian reptile, discovered by Dr. Hayden.

Nine of the specimens referred to consist of crowns of teeth or of their summits, which resemble those of *Megalosaurus*, being compressed conical and curved, and having trenchant, dentated borders. They are generally thicker in relation to their breadth than in *Megalosaurus*, which might only be a specific distinction, were it not that there are several other teeth in the same collection apparently of the same animal, but quite peculiar in form.

One of the specimens is a curved conical crown, nearly circular in transverse section, having a prominent dentated ridge on each side. A second specimen is a crown, demi-elliptical in transverse section, with the posterior borders dentated. A third specimen is a small fragment of a very large tooth, apparently

with nearly the same form as the latter; and a fourth specimen is a portion of the crown of a tooth, demi-elliptical in transverse section, with the posterior borders elevated but not dentated.

Had the different forms of teeth above indicated been obtained from different localities, they might have been referred to at least four distinct genera, but having been discovered together, and possessing the same structural appearances, I suspect them to have belonged to one and the same species.

The largest specimen resembling the teeth of *Megalosaurus* in its present condition, is $1\frac{1}{2}$ inches long from the apex, $\frac{1}{2}$ of an inch broad at base, and 5 lines thick. One of the specimens, which is demi-elliptical in section, is over an inch in length from the apex, 8 lines broad at base, and $3\frac{1}{2}$ lines wide at the posterior surface. Another specimen, apparently with the same form as that just indicated, in its perfect condition appears to have had the crown over two inches in length, nearly an inch in breadth, and about half an inch in width posteriorly.

5. *CHONCILLUS HUMILIS*, Leidy.

The species is founded on ten specimens of shed crowns of teeth, apparently of a small species of crocodile. The largest specimen is $7\frac{1}{2}$ lines long and $3\frac{1}{2}$ lines in diameter at base, which is nearly circular. Another specimen is 7 lines long and $2\frac{1}{2}$ lines in diameter at base; and a third specimen is 6 lines long and $3\frac{1}{2}$ lines in diameter at base. These are all moderately curved conical, nearly circular in transverse section, with the two usual internal acute ridges, and with the intervening surfaces slightly striate or nearly smooth. The crown of a posterior tooth is compressed, mammillary in form, $2\frac{1}{2}$ lines long and $2\frac{1}{2}$ wide at base, with the summit obtuse, and the sides finely and longitudinally rugose.

6. *TRIONYX PUNCTATUS*, Leidy.

The species is founded on fragments of several costal and sternal plates. The exterior surface of the costal plates is covered with pits, excepting close to the margins; and the pits are small and round at the vertebral extremity, and gradually increase in size outwardly and become antero-posteriorly oblong oval and reniform. A vertebral fragment of a third or fourth costal plate, a little over an inch in length, is 11 lines wide and 2 lines thick. Small fragments of the sternal plates present an exterior surface covered with broken vermicular ridges and tubercles separated by wide intervals. Fragments of a hyposternal plate are 3 lines in thickness.

7. *LEPIDOTUS OCCIDENTALIS*, Leidy.

A species proposed on five specimens of thick lozenge-shaped scales, with the root prolonged in the direction of the long diameter. The enamelled surface of the scales is smooth and shining. The largest one has its sides about 4 lines long, the smallest one about $2\frac{1}{2}$ lines long.

8. *LEPIDOTUS HAYDENI*, Leidy.

A species proposed on a single specimen of a thick oblong square scale, the long sides of which measure 5 lines, and the short sides $3\frac{1}{2}$ lines. The root projects forward from one of the long sides, and the enamelled surface of the scales is covered with parallel square lines.

This species is named in honor of Dr. Hayden, who collected the remains characterized in this paper; and which remains, I suspect, indicate the existence of a formation like that of the Wealden of Europe.

Notice of a new Fossil Genus belonging to the Family BLASTOIDEA, from the Devonian strata near Louisville, Kentucky.

By B. F. SHUMARD, M. D., and L. P. YANDELL, M. D.

The remarkable Crinoid, now for the first time brought to the notice of Palaeontologists, was discovered by us as early as 1847, in a gray sub-crystalline limestone on Bear Grass Creek, near Louisville, Kentucky, associated with characteristic fossils of the Devonian system. At that time we had observed only detached plates of the genus, which did not permit us to recognize its most

important peculiarities, and we regarded it as being merely a species of *Pentrimis* (Say.) analogous to (*P. Elæacrinus*) *Verneuli* (Römer.) Afterwards, through the politeness of S. A. Casseday, Esq., of Louisville, we were put in possession of two individuals in a more perfect state of preservation, and these, with some specimens since found by ourselves, have furnished the material from which we are enabled to add a new and interesting genus to the family Blastoidæ.

ELEUTHEROCRINUS, *Nov. Gen.*

Agreeable to the plan pursued by Messrs. D'Koninck and Le Hon, we give as the formula of the genus—

Basal pieces, 3.—One small, two irregular and very much elongated.

Radial pieces, 1×5 .—Four-forked, occupying nearly the whole length, one short and not forked.

Interradial pieces, 1×5 .—Small.

Pseudoambulacral areas, 5.—Four linear extending nearly the entire length of the calyx, one short, sub-triangular, situated on the summit plane.

Column, none.

Ovarial apertures, 8 (?)

Generic characters.—The calyx is of an elliptical form, truncated at summit and sub-triangular at base.

The *base* is very irregular in form, sub-triangular at its lower part, and prolonged on one of its sides to a remarkable length. It consists of three pieces, one of which is small, lozenge-shaped; the other two are precisely alike, very large and prolonged nearly to the middle of the calyx. These latter pieces are joined together in the median line by a straight suture, with which their external edges are sub-parallel, except the inferior fifth, which exhibits a small angular fold, directed obliquely forwards to articulate with the inferior edges of the single basal piece. The superior edge of this fold is also emarginated to receive the extremity of an elongated radial piece.

Radial pieces.—Four are non-symmetrical, occupy nearly the entire length of the calyx, and are channelled almost to the base for the reception of the pseudo-ambulacræ. The middle pair alternate with the single basal, the exterior ones repose on the emarginated edges of the fold of the large basals. The fifth radial piece scarcely exceeds one-half the length of the others, though it is much wider. It rests on the upper edges of the large basals and between the superior half of two of the long radials. Its upper edge reaches to the level of the summit plane. The surface is destitute of a pseudo-ambulacral groove.

Interradial pieces, five, small, alternating with the radials. Three of them are somewhat lozenge-shaped; two irregular in form, articulate, with the short radial piece.

Pseudoambulacral areas, four are linear, commence at the central summit, opening and descend nearly to the base; the fifth is triangular and lies horizontally on the summit plane just within the edge of the short radial piece.

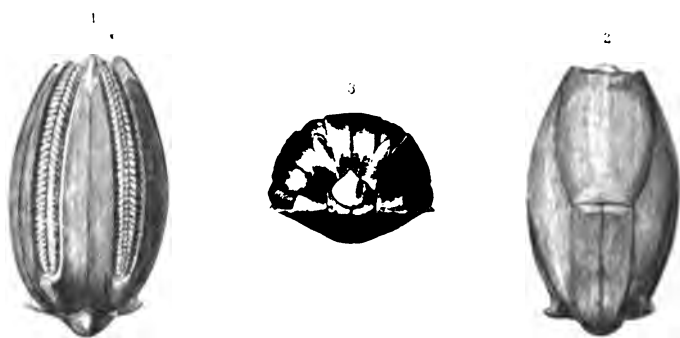
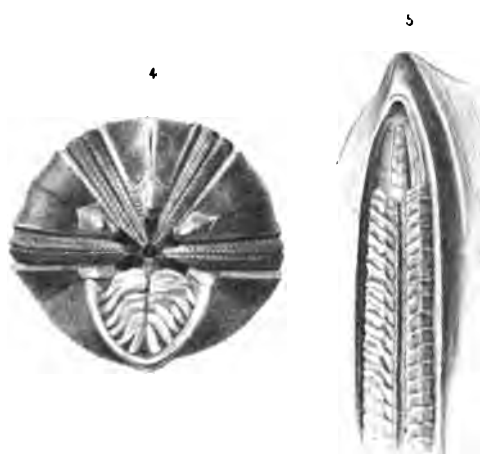
Ovarial apertures. Only eight of these openings are visible in the specimens under examination; two are situated at the extremity of each lozenge-shaped interr radial, each pair being divided by a mesial septum; but at the extremity of each irregular interr radial there is apparently merely a simple round opening without any visible septum. No anal opening is to be seen in our specimens. *Mouth* nearly central.

Column. No trace of an aperture or articular facet exists at the base to indicate that the genus possessed a column.

ELEUTHEROCRINUS CASSEDAI. *Nov. sp.*

The body of this species is of an ellipsoidal form, truncated at summit, sub-triangular below, and flattened on that portion of the circumference occupied by the large basals and short radial. The surface of all the principal pieces is marked with numerous delicate striæ, slightly flexuous and running in a direction nearly parallel with the edges.





Basal pieces. The outer long ones descend lower than the middle pair and the extremities of their pseudoambulacral fields are nearer the inferior extremities of the pieces. Their internal limb is narrow, lanceolate and obliquely truncated above; the external one is broadest, obtusely triangular, and bent backwards at nearly right angles, to unite with the long basals and short radial, forming with these a flattened convex surface, whose transverse diameter equals the total width of the calyx. The middle pair, or those standing over the small basal, are more regular in form than the outer ones, their branches narrow and equal. The internal edges of all the branches of the long radial pieces are limited by a fine carina, terminating below in a triangular projection, on which rest the extremity of a pseudoambulacral field. The lateral sutures are also marked by a fine carina. The short radial piece is sub-pentagonal and angulated in the middle; its length and breadth about equal. Below it rests by a double concave edge on the extremities of the long basals; the lateral edges are arched, the outline of the superior edge somewhat V-shaped.

Interradial pieces. The three regular ones are swelled and rounded at the apex, and terminate below in three salient angles; the lateral edges are strongly crenulated. The irregular pieces are situated on either side of the short radial. They are scarcely more than half the width of the others, and only one of the lateral edges is crenulated.

Pseudoambulacral areas. The four linear areas are convex, and project above the plane of the interradian plates. The pore pieces are transverse, sub-pentagonal and finely crenulated at their internal edges. Their surfaces are deeply indented, and their number on each side of a field amounts to about thirty-five. The supplementary pore pieces are sub triangular and very minute. The fifth or anomalous area is small, triangular, and situated on the summit plane just within and a little below the superior edge of the short radial piece. The pore pieces are transverse, wide, and amount to about seven on each side of a field. Their form and that of the supplementary pore pieces cannot be well made out in the specimens on hand. The apertures situated at the extremities of the pieces amount to about fourteen for the entire field.

The *Eleutheroerinus Casedayi* is the only known species of the genus.

References to Plate II.

- Fig. 1. Profile view of a specimen four times enlarged.
2. Opposite view of the same, exhibiting the form of the short radial, and the prolonged part of the long basals.
3. Basal view.
4. Summit view, showing the anomalous pseudo-ambulacral field.
5. A portion of one of the linear pseudo-ambulacral fields, very much enlarged.

The report of the Corresponding Secretary for February and March was read and adopted.

On motion of Dr. Elwyn, it was *Resolved*, That the members of the Methodist Conference, about to convene in this city, be invited to visit the Museum of the Academy on public days, during the session of the Conference.

ELECTION.

Mr. James E. Caldwell, Dr. Charles M. Cresson and Mr. A. J. Brasier, all of Philadelphia, were elected *Members*, and Dr. F. V. Hayden, of St. Louis, Mo., was elected a *Correspondent*.

April 1st.

Mr. ORD, President, in the Chair.

Letters were read

From the Imperial Society of Naturalists of Moscow, dated Feb. 17, 1856, announcing the celebration of its semi-centennial anniversary.

From Mr. J. H. Rauch, dated Burlington, Iowa, March 11, 1856, acknowledging the receipt of his notice of election as a Correspondent.

From the Lyceum of Natural History, of New York, dated March 20, 1856, acknowledging receipt of part 2, vol. 3, new series, of the Journal.

From the Trustees of the New York State Library, dated Albany, March 26, 1856, acknowledging the receipt of the Proceedings of the Academy.

From the University of Wartzburg, dated December 21, 1855, acknowledging the receipt of the Journal, vol. 3, part 1, and Proceedings, vol. 7, Nos. 2—7.

From Mr. T. M. Peters, dated Moulton, Alabama, March 18, 1856, transmitting the donation to Museum, acknowledged this evening.

From the Philadelphia Annual Conference of the Methodist Episcopal Church, dated March 31, 1856, returning acknowledgments for the invitation from the Academy to visit the Museum.

Dr. Leidy read a paper, for publication in the Proceedings, entitled "Notices of three extinct Fishes." Referred to Mr. I. Lea, Dr. Wilson and Dr. Bridges.

Mr. Lea presented a paper, intended for publication in the Journal, entitled "On the Sandstone Fossils of the Connecticut river, by James Deane, M. D.;" which was referred to Mr. Lea, Dr. Leidy and Mr. Messerschert.

Mr. Lea also presented the following papers for publication in the Proceedings, viz: "Descriptions of new Fresh-water shells of California," "Description of a new species of *Triquetra* Klein," and "Description of a new genus of *Naiades*," all of which were referred to Dr. Bridges, Dr. Wilson and Mr. Hanson.

April 8th.

Mr. LEA, Vice-President, in the Chair.

Dr. Leidy presented a paper for publication in the Proceedings, entitled "Notices of remains of extinct Mammalia discovered by Dr. F. V. Hayden in Nebraska Territory;" which was referred to Dr. Wilson, Prof. Haldeman and Mr. Lesley.

Mr. Cassin presented the following, which were unanimously adopted, *Resolved*, That the 7th vol., and so much as is published of the 8th vol. of the Proceedings of this Academy, and the last two Nos. of the Journal of the Academy, be presented to Sandwith Drinker, Esq., of Canton, China.

Resolved, That so much 'as is published of the 8th vol. of the Proceedings of this Academy and the last two Nos. of the Journal, be presented to W. W. Wood, Esq., of Manilla.

April 15th.

Vice-President BRIDGES in the Chair.

Letters were read—

From the Smithsonian Institution, dated Washington, March 1, 1856, acknowledging receipt of last No. of the Journal.

From the American Antiquarian Society, dated Worcester, Mass., April 1st and 8th, 1856, acknowledging receipt of Proceedings, vol. 7, and No. 1, vol. 8, and transmitting in exchange their publications announced this evening.

From the Royal Library of the University of Gottingen, dated 17th Dec., 1855;

From the University Library of Heidelberg, dated 8th Jan., 1856;

From the University of Jena, dated 5th Jan., 1856;

From the Natural History Society of Dantzic, dated 20th Dec., 1855; and

From the Wurtemberg Natural History Society, dated 20th Dec., 1855; severally acknowledging receipt of the Proceedings of the Academy.

A paper was presented from Robert Kennicott, Esq., intended for publication in the Proceedings, entitled, "Description of a new Snake from Illinois;" which was referred to Dr. Hallowell, Dr. Leidy, and Dr. Corse.

Dr. Leidy presented for publication in the Proceedings a paper entitled, "Descriptions of thirty new species of Acepala and Gastropoda from the Cretaceous formations of Nebraska Territory, by F. B. Meek, and F. V. Hayden, M. D." Referred to Mr. Lea, Dr. Leidy, and Dr. Hallowell.

Dr. Leidy also presented for publication in the Proceedings the following:

"Notice of the Remains of a species of Seal from the Post-Pliocene Deposit of the Ottawa River, U. C." and

"Notices of several genera of extinct Mammalia previously less perfectly characterized;" both of which were referred to Dr. Le Conte, Mr. Lesley, and Mr. Vaux.

Mr. Lea presented a paper for publication in the Proceedings, entitled, "Descriptions of twenty-five new species of Exotic Uniones." Referred to Dr. Wilson, Mr. Hanson, and Dr. Bridges.

Mr. Lea read some notes from a paper he is preparing for the Journal of the Academy on the New Red Sandstone Formation of Pennsylvania, and stated that he had, during an excursion last summer, found in the dark shales of that Formation, near Phoenixville, on the Schuylkill, the tooth of a Sauroid Reptile, which he thus characterised.

*CENTEMODON** *SULCATUS*. Tooth smooth, rather thick, slightly curved, with trenchant edges, rounded on the exterior portion, sulcate on the lower part near the base, covered with very minute distinct striae from the point to the base, which striae cross the sulcations in slightly oblique lines. Length sixteen-twentieths of an inch, greatest breadth four twentieths of an inch; pulp cavity large.

On comparing this tooth with *Clepsysaurus Pennsylvanicus*, which he had described from the same Red Sandstone Formation in Lehigh county, it will be found to differ very widely. The edge is not serrate on any part like that genus, nor is it so large or so attenuate. The form, too is more compressed. It differs from the teeth of *Bathynathus borealis*, Leidy, from the New Red Sandstone of Nova Scotia, in size, being smaller and being more attenuate, as well as in having a trenchant smooth edge and not a serrate edge. It is about the size and approaches the form of Prof. Owen's figure of *Labyrinthodon*, plate 63, A. f. 2, of *Odontographia*, but it is more flattened.

Mr. Lea also stated that in the greenish and blackish shales of the same locality he found two species of *Posidonia*, which genus is so characteristic of this portion of the formation and existing in immense quantities. As they seem to differ from that figured by Sir Charles Lyell, in his *Elementary Geology*, as coming from Oolitic coal shale of Richmond, Virginia, Mr. Lea proposed the names of *P. ovata* and *P. parva*, the first being about seven-twentieths of an inch in transverse diameter. The latter is more rotund, and about three-twentieths of an inch in transverse diameter, both being covered with numerous minute concentric costae over the whole disc.

Near to this locality and superimposed, Mr. Lea obtained a specimen of impure dull red limestone, which contained, on a partially decomposed surface, impressions presenting the appearance of *Foot-marks*, somewhat like *Chelichnus Duncani*, Owen, figured by Sir Wm. Jardine in his *Ichnology*, for which Mr. Lea proposed the provisional name of *Chelichnus Wymanianus*, after Professor Wyman, of Cambridge, Mass.

From the same formation and locality were procured the impressions of plants, some of which belong to the *Conifera*. One of the cones was nearly six inches long and full an inch wide. These were accompanied by other plants of very obscure character, covering large portions of the surface of some of the layers.

Mr. Lea also mentioned that he had observed the same Red, Black and Gray Shales at Gwinnedd, on the North Pennsylvania Railroad, where he found the same *Posidonia*, and some of the same obscure plants, impressions of which covered the surfaces of many of the rocks. A single specimen was obtained of a plant with long leaves somewhat resembling *Noeggerathia cuneifolia*, Brogniart, which is from the Permian.

In the Black *Posidonia* Shales was found a single Ganoid scale, which is more like *Pygopteria mandibularis*, Agas., from the Marl Slate (Lower Permian) than any other which had come under Mr. Lea's notice. There were other obscure forms observed, which have not yet been satisfactorily found to be analogous to any known forms, but which Mr. Lea hoped to be able to make out when he should figure all the specimens and describe them more at large for the *Journal of the Academy*.

April 22d.

Vice-President BRIDGES in the Chair.

A paper was presented from J. S. Newberry, M. D., intended for publication in the *Proceedings*, entitled, "Descriptions of several new

* *Klincks aculeus* and *idus dens*.

genera and species of Fossil Fishes from the Carboniferous Strata of Ohio." Referred to Drs. Le Conte, Leidy, and Hallowell.

Mr. Samuel Ashmead, in presenting the very fine collection of Marine Algae made by himself during the past winter at Key West, Florida, stated that he was indebted to Prof. Bailey, of West Point, for his assistance in determining a number of the species.

April 29th.

Vice President BRIDGES in the Chair.

The Committees on Mr. Lea's papers, read 1st inst.; on Dr. Leidy's paper, read 8th inst.; on Mr. Kennicott's paper, read 15th inst.; on a paper by Messrs. Meek and Hayden, read same date; on Dr. Leidy's papers, of same date; on Mr. Lea's paper, of same date; and on Dr. Newberry's paper, read 22d inst.; severally reported in favor of publication in the Proceedings.

Description of a New Sub-Genus of NAIADES.

By ISAAC LEA.

Family NAIADES.

Sub-genus PLAGIODON.

Testa æquivalvis, inæquilatera, obliquè trigona, valdè inflata; dentibus cardinalibus crenulatis, compressis, transversis, curtis, in utraq. valvâ duplicis; dentibus lateralibus nullius; ligamentum vix extrorsum; impressio muscularis antica composita.

This sub-genus is proposed for a fluviatile shell, which is nearer to *Monocondylea*, D'Orbigny, than to *Margaritana*, Schumacher; and may be considered properly so interposed as a link to connect them.

PLAGIODON ISOCARDIODES.

Testâ lævi, rotundo-trigona, globosa, ventricosissimâ, ad lateris planulatis, valdè inæquilaterali, anticè brevissimâ, umbonibus tumidis, valvulis subtenuis; natibus valdè elevatis, incurvis, terminalis; epidermide subrugosa, tenebrosio-olivacea; dentibus cardinalibus crenulatis, compressis, transversis, curtis, in utraq. valvâ duplicis; margaritâ albâ et iridescente.

Hab. Rio Plata. Mr. E. Verrean, Paris.

Description of a New Species of TRIQUETRA, Klein (HYRIA, Lamarck.)

By ISAAC LEA.

TRIQUETRA LANCEOLATA.

Testâ lævi, transversissimâ, subcompressâ, lanceolatâ, valdè inæquilaterali, posticè acuto-angulatâ: anticè caudatim producta; valvulis crassis; natibus parvis, prominulis, ad quartam anteriorem partem positis; epidermide striatâ, tenebrosio-fusca; dentibus cardinalibus subgrandibus crenulatisque; lateralibus prælongis rectisque; margaritâ albâ et argenteâ.

Hab. China? Mr. Asa Fitch.

Description of New Fresh water Shells from California.

By ISAAC LEA.

Family LYMNÆANA.

Genus POMPHOLYX.

Testa rotundo-gibbosa, subtus retrorsa, superne planulata, non umbilicata; spira depressa, apertura amplissima, subrotunda, effusa; labro acuto; labio incrassato, planulato; operculum nullum.

POMPHOLYX EFFUSA. Testā parvā, striatā, rotundo-gibbosā, subtenui, effusā, luteo-corneā; anfractibus trinis, supernē planulatis, infernē convexis; aperturā subrotundā, dilatatā, intus albidā, maculatā.

Hab. Sacramento River, California. Dr. Trask.

MELANIA SHASTAENSIS. Testā striatā, subcylindraceā, subtenui, tenebroso-corneā, fasciatā; spirā elevatā ad apice plicatā; suturis valdē impressis; anfractibus convexis; aperturā parvā, ovatā, intus albidā; columellā lævi, incurvatā et recurvatā.

Hab. Shasta and Scott Rivers, California. Dr. Trask.

MELANIA NIGRINA. Testā lævi, parvā, conicā, subtenui, nigricanti, politā; spirā subelevatā; suturis impressis; anfractibus regulariter convexis; aperturā parvā, ovatā, supernē angulatā, intus tenebroso-purpureā; columellā incurvā, purpureā.

Hab. Clear Creek, Shasta County, California. Dr. Trask.

PHYSA TRITICA. Testā subfusiformi, pellucidā, politā, rufo-castaneā; spirā brevi, subacutā; suturis subimpressis; anfractibus quaternis, subconstrictis; aperturā elongatā, intus lineatā.

Hab. Shasta County, California. Dr. Trask.

PLANORBIS TRASKII. Testā magnā, tenebroso-corneā, subcylindraceā, minutē, crebrē et regulariter striatā, supernē latē et profunditer umbilicatā; infernē magis excavatā; anfractibus quinis, supernē acutē carinatā ad peripheriam, infernē obtusē carinatā; aperturā auriculæformi.

Hab. Kern Lake, Tulan County, California. Dr. Trask.

LYMNÆA PROXIMA. Testā acuto-conicā, subtenui, crebrē et irregulariter striatā, corneā, minutē perforatā; spirā subelevatā, ad apicem acuminatā; suturis valdē impressis; anfractibus septenis, convexis; aperturā subinflatā, subellipticā, intus fasciatā, columellā paulo plicatā.

Hab. Arroya San Antonio, California. Dr. Trask.

ANCYLUS PATELLOIDES. Testā magnā, crassā, ellipticā, maculatā, obliquē conicā; striis crebris, minutis; apice submediali.

Hab. Sacramento River, California. Dr. Trask.

The following species, heretofore described, were part of the "envol" made by Dr. Trask.

Margaritana margaritifera, Lea.

Alas. falcata, Gould.

Alas. Yubaensis, Trask.

From Klamath and Yuba Rivers.

I received specimens of this shell from Prof. Nuttall in 1837, brought by him from Columbia River. I thought then, and I still think, there were not characters sufficiently distinct in them to form a new species. The observations published at the time (*Tran. Am. Phil. Soc.* v. 6, p. 97) are still in accordance with my opinions, after having had many specimens from various localities under examination. The purple in the nacre is stronger than any I have seen from other localities, but this with the other differences would not I think warrant its being considered more than a mere variety of *M. margaritifera*.

Anodonta Wahlamensis, Lea. Tr. Am. P. S. v. 6, p. 78. = *A. triangulata*, Trask. *A. rotundovata*, Trask. From Sacramento River.

Anodonta angulata, Lea. Tr. Am. P. S. v. 6, p. 97. = *A. feminalis*, Gould. *A. Randallii*, Trask. From upper San Joaquin.

Helix Oregonensis, Lea. Trans. Am. P. S. v. 6, p. 100. Point Cypress, Monterey County.

Helix Nickliniana, Lea. Trans. Am. P. S. v. 6, p. 100. Tomales Bay and Deadman's Island.

Helix Californiensis, Lea. Trans. Am. P. S. v. 6, p. 99. Point Cypress, Monterey County.

Lymnaea exigua, Lea. Trans. Am. P. S. v. 9, obs. v. 3. San Antonio Arroya.

Lymnaea pallida, Adams. Journ. Boston Nat. Hist. Soc. v. 3. San Antonio Arroya.

Physa heterostropha, Say. Nicholson's Ency. Am. Edition. Los Angeles.

Melania occata, Hinds. Voy. of the Sulphur, pl. 15, f. 5. Sacramento River.

Melania seminialis, (*Paludina*, Hinds.) Voy. Sulphur, pl. 16, fig. 22. Sacramento River.

Planorbis tricoloris, Say. Nicholson's Ency. Am. Ed. Hern Lake. Slightly varies from the Michigan specimens.

Planorbis ammon, Gould. Proc. Boston Soc. Nat. Hist. v. 5, p. 129. Lagoons, Sacramento Valley.

Descriptions of twenty-eight new species of Acephala and one Gasteropod, from the Cretaceous formations of Nebraska Territory.

By F. B. MEEK and F. V. HAYDEN, M. D.

PROLADOMYA UNDATA. Shell oval or ovate, moderately ventricose, anterior end rounded, posterior extremity rounded chiefly from below, cardinal border nearly straight; base somewhat broadly curved; beaks rather elevated, incurved, placed between the centre and the anterior end; surface (of cast) ornamented by numerous, regular, distinct, concentric undulations, which are crossed by much smaller radiating costæ, scarcely marked in the depressions between. Length about one inch.

As we have not seen the hinge of this species, we refer it with doubt to the above genus. The radiating costæ are about equal, the spaces between, and in consequence of being marked only on the concentric undulations, and not in the intermediate depressions, furnish a character by which even fragments of the species may be at once identified.

Locality and position. Mouth of Judith River, in a sandstone supposed to be same as No. 1 of the series.

GONIOMYA AMERICANA. Our specimens of this interesting shell are too imperfect to give a clear idea of its form, though the direction of the lines of growth indicate an oblong or very narrow oval outline, with a narrowly rounded anterior and subtruncate posterior. Laterally the valves must have been considerably compressed. The beaks are small, not much elevated, and placed in advance of the centre. On the two extremities the costæ, which are quite distinct, traverse the shell obliquely backwards from near the hinge to the base, while those originating immediately in front and behind the beaks, converge and meet at various distances down the sides of the shell, so as to form arched or convex angles of from 20° to 30°. Surface ornamented by fine irregular lines of growth, crossed by regular, equi-distant, radiating rows of minute transparent granules, placed at regular distances from each other. These granules are so small as to be scarcely visible without the aid of a strong magnifier, under which they look like minute drops of melted amber.

In its surface markings this species resembles *G. Dubois* of Prof. Agassiz, (*Etudes critiques sur les Mollusques fossiles*, tab. 1.) but in our species the converging costæ continue to meet at the same acute angles as far as they can be traced towards the points of the beaks, while on the beaks of *G. Dubois* and

other allied species, these angles are truncated, and the opposite costæ united by horizontal bars. Perfect specimens would probably show other differences. This is, we believe, the first species of this genus found in America. According to Prof. Bronn, (*Index Palæontologicus*), five species have been hitherto described from the whole cretaceous system, two of which were from the Neocomien, two from the green sand, and one from the true chalk.

Locality and position. Moreau Trading Post, No. 5 of the series.

SOLENI SUBPLICATUS. Shell very thin and fragile, elongated, cardinal and basal margins straight and parallel; buccal extremity obliquely truncate, anal end rounded from below, both ends gaping; beaks nearly at the anterior extremity, not distinct from nor rising above the hinge line. Six to eight broadly rounded, very faint plications radiate from behind the beaks obliquely backwards to the posterior margin, to which they appear to have imparted a slightly waved outline; surface marked with faint lines of growth, and minute transverse closely arranged striae, which do not radiate from the beaks, but traverse the shell at right angles to its longitudinal diameter. Length 1.15 inches; breadth .26 inch; height .42 inch.

The fine transverse striae on this shell are only visible under a high magnifying power, and appear to have been as well marked on the inside as on the exterior, distinct impressions of them being left on internal cast.

Locality and position. Moreau river, No. 5 of the series.

TELLINA GRACILIS. Shell elliptical, moderately compressed, extremely thin and fragile; buccal margin rounded; posterior end contracted, subtruncate, and having a broad obsolete ridge passing from the beaks obliquely backwards to the postero-basal margin; cardinal border convex before and concave behind the beaks; lower border forming a regular elliptical curve; beaks rather depressed, and located a little behind the centre; surface marked with fine lines of growth. Length .90 inch; breadth of left valve .17 inch; height .60 inch.

The above description is made out from a single left valve, so attached to the matrix as to show only external characters.

Locality and position. Mouth of the Judith, in a sandstone supposed to be the same as No. 1 of the series.

TELLINA EQUILATERALIS. Shell elliptical, compressed, moderately thick, extremities rounded; anterior end slightly broader than the posterior; beaks small, not elevated, located a little in advance of the middle; surface marked with fine regular concentric lines. Length of right valve 1.15 inches; breadth .12 inch; height .57 inch.

We have of this species but one right valve, showing none of its internal characters. The position of its beaks, as well as its much greater thickness, preclude the idea of its being an opposite valve of the last.

Locality and position. Same as preceding.

TELLINA? CHEYENENSIS. Shell ovate, compressed, very thin; anterior extremity rounded; posterior end subtruncate or rounded from above, and very obtusely angular below; base forming an elliptic curve; beaks somewhat elevated, placed a little in advance of the middle, surface ornamented with fine lines of growth and numerous small regular concentric wrinkles, becoming mere lines near the beaks and on the extremities. Length .88 inch; breadth .36 inch; height .67 inch.

We have only seen the outside of this specimen.

Locality and position. Forks of Cheyenne River, No. 4 of the series.

TELLINA SCITULA. Shell elliptical, small, thin, much compressed, curved so as to be convex on the left, and slightly concave on the right sides; extremities narrowly rounded, the anterior end being wider than the posterior; beaks small, nearly central; base forming a regular elliptic curve; surface polished, and marked with distinct lines of growth. Length .50 inch; breadth .13 inch; height .30 inch.

Locality and position. Moreau River, No. 5 of series.

TELLINA SUBELLIPTICA. Shell small, ovate or elliptical, thin, much compressed; anterior extremity rounded; posterior end somewhat rounded or subtruncate; beaks small, not much elevated, a little in advance of the centre; surface rather faintly marked with fine lines of growth. Length .50 inch; breadth .12 inch; height .32 inch.

This species is chiefly distinguished from the last by its more broadly rounded extremities, less distinct lines of growth, and greater thickness.

Locality and position. Cherry Creek, Upper part of No. 5 of the series.

TELLINA PROUT. Shell ovate, much compressed, very thin and fragile; extremities rounded; posterior end somewhat contracted, and having a broad, indistinct ridge passing from the beaks obliquely backwards to the postero-inferior margin, the outline of which it may have slightly modified; cardinal border convex before, and concave behind the beaks; umbones nearly central, elevated, somewhat gibbous, closely approximate; surface ornamented with fine but distinct lines of growth; internal laminae of the shell marked with faint, very fine radiating lines; sinus of the pallial impression oblong, obtuse or subtruncate at the extremity, about one-third the length of the shell. Length 2.42 inches; breadth .83 inch; height 1.60 inches.

We have not seen the hinge of this shell. The species is dedicated to Dr. H. A. Prout, of St. Louis, Missouri, to whom we are indebted for the only specimen we have seen.

Locality and position. Fort Benton, No. 4 of the series.

CYTHÆRA DEWEY. Shell subcircular or slightly oval, somewhat compressed; beaks moderately elevated, a little in advance of the centre; surface ornamented by distinct irregular lines of growth; lunule small, narrow, oval or broad lanceolate, not very distinctly impressed; muscular impressions shallow, anterior one narrow ovate; posterior broad ovate, acutely angular above; pallial impression having a rather deep triangular sinus, forming at the apex an angle of 55°; border smooth. Length .96 inch; breadth .51 inch; height .85 inch.

Specimens slightly more elongated, but apparently identical with this, occur on the Yellow-stone River in a bed we have considered the upper part of No. 4, but which may represent No. 5. This species is dedicated to Prof. Chester Dewey, of Rochester University, N. Y.

Locality and position. Moreau River, No. 5 of the series.

CYTHÆRA NEBRASCENSIS. Shell subcircular, much compressed; beaks somewhat elevated, small, a little in advance of the centre; ligamentary cavity long and very narrow lanceolate; surface marked with rather faint lines of growth. Length .70 inch; breadth .28 inch; height .60 inch.

The much more compressed form of this shell will serve to distinguish it at once from the last.

Locality and position. Same as preceding.

CONSULA VENTRICOSA. Shell small, very thin, subglobose, nearly equivalve; anterior end broadly rounded; posterior extremity abruptly contracted into a narrow prolongation; beaks elevated, ventricose, a little behind the centre of the globose part of the shell; surface marked with distinct irregular lines of growth; cardinal tooth of right valve prominent, flattened; posterior muscular impression deep; pallial impression having a broad triangular sinus. Length .55 inch; breadth .26 inch; height .27 inch.

Locality and position. Same as last.

CONSULA MORRISII. Shell small, subovate, ventricose, rounded in front, suddenly contracted and somewhat attenuate behind; beaks prominent, situated behind the middle of the broadest part of the shell, rather inclined backwards; surface ornamented with strong, regular, elevated concentric lines, nearly equaling the spaces between. Length about .27 inch; breadth .10 inch; height .16 inch.

We have not yet seen the left valve of this shell, nor the interior of the right,

from which the above description is made out. The species may be distinguished from the last by its much stronger and more regular concentric lines.

Locality and position. Same as last.

Corbula? GREGARIA. Shell very small, somewhat triangular, subglobose; right valve more ventricose than the left; beaks nearly central, gibbous, that of the right valve elevated considerably above the left, incurved; surface polished and marked with a few faint, irregular, concentric wrinkles, indicating stages of growth; hinge having under the beaks a single prominent tooth in each valve; anterior muscular attachment indistinct, posterior raised upon a strongly projecting lamina; pallear impressions scarcely sinuous. Length .13 inch; breadth .10 inch; height .13 inch.

It is with much doubt we refer this little shell to the genus *Corbula*. In the inequality of its valves, as well as in the character of its hinge, it agrees exactly with that genus, but we have seen no species of *Corbula* having either of the muscular attachments raised upon a projecting plate, as in this shell. In this respect it is more like *Cordilla* of Deshayes, but it appears to want the spoon shaped projection of the hinge of that genus; and it is the posterior, instead of the anterior muscular attachment that here forms a projecting plate. We suspect it belongs to an undescribed genus.

Locality and position. Yellow-stone River, one hundred and fifty miles from mouth, where it is found in vast numbers compacted together in concretions, in the upper part of No. 4 of the series.

ASTARTE GREGARIA. Shell small, subtriangular, rounded below and at the extremities, nearly equilateral, valves moderately convex; beaks much elevated, rather pointed, incurved, approximate, slightly turned forward; escutcheon narrow lanceolate; lunule somewhat broadly lanceolate or narrow ovate, not very distinctly impressed; surface ornamented by small, but distinct concentric undulations, and much finer lines of growth; border smooth; muscular impressions shallow. Length .21 inch; breadth .14 inch; height .21 inch.

Locality and position. Yellow stone River, from a bed probably near the top of No. 4, if not in No. 5 of the series. Abundant.

NUCULA SCITULA. Shell ovate, rather ventricose, rounded in front, somewhat contracted and narrowly rounded behind; umbonal region gibbous; beaks prominent, incurved, approximate, located in advance of the middle; surface marked with distinctly elevated, regular concentric lines, about equal to the spaces between, and stronger on the middle than towards the extremities of the valves; dorsal border marked by a distinct longitudinal groove behind the beaks. Length .39 inch; breadth .21 inch; height .22 inch.

From *N. ventricosa* of Hall and Meek, (see vol. 5, new series, Trans. Am. Acad. Arts and Sciences,) to which it bears some resemblance, this may be distinguished by its beaks being located nearer the anterior end, and by its larger size and comparatively smaller concentric lines.

Locality and position. Moreau River, No. 5 of the series.

NUCULA EVANSI. Shell elongate, narrow elliptical, thin, moderately convex; cardinal margin nearly straight, marked with a distinct longitudinal groove on each valve; extremities rounded, posterior end compressed and slightly gaping; inferior border forming an elliptical curve, with sometimes a faint impression near the middle; beaks very small, not much elevated, located in advance of the centre; surface polished and marked with faint lines of growth; muscular impressions indistinct; teeth of the hinge numerous, closely interlocked. Length .72 inch; breadth .22 inch; height .32 inch.

Dedicated to Dr. John Evans, U. S. Geologist of Oregon Territory.

Locality and position. Moreau River, No. 5 of the series.

NUCULA EQUILATERALIS. Our specimens of this shell are only casts. The species may be characterized as follows: subelliptical, rather convex; extremities narrowly rounded; beaks central, somewhat elevated; umbonal region gibbous; muscular impressions comparatively large, distinct, but not deep; border

smooth; teeth of the hinge numerous, short, obtuse, closely interlocking. Length .64 inch; breadth .21 inch; height .25 inch.

Even casts of this species may always be known from the last, by the central position of the beaks and more narrowly rounded extremities.

Locality and position. Same as last.

NUCULA SUBFLATA. Shell small, oval, compressed; anterior end obliquely subtruncate from the beaks a little more than half way down; posterior end round, base broadly rounded; beaks prominent, compressed, located about half way between the centre and the anterior end; surface (of cast) having a few faint indications of concentric undulations; teeth of hinge moderately long; border smooth. Length .25 inch; breadth .09 inch; height .20 inch.

Of this little *Nucula* we have only seen casts. It may be known from other species from these formations by its short compressed form and elevated beaks. It is rare.

Locality and position. Yellow-stone River, one hundred and fifty miles above mouth, in a bed supposed to be upper part of No. 4 of series.

NUCULA CANCELLATA. Shell rather large and thick, ovate or subtriangular, ventricose, pearly within; anterior end short, obliquely truncate, posterior end longer, narrowly rounded; umbonal region gibbous; beaks somewhat elevated, slightly incurved; escutcheon lanceolate; lunule ovate, flattened, but scarcely impressed; surface ornamented by numerous flatly rounded, simple, closely arranged, radiating costae, which are crossed by small, irregular, concentric wrinkles, and finer indistinct lines of growth; border neatly crenulated. Length .93 inch; breadth .50 inch; height .65 inch.

This beautiful *Nucula* resembles in its surface markings *N. pectinata* of Sowerby, (Min. Conch. vol. 2, page 208, fig. 6, 7.) but differs in the form and depth of its lunule, which is rather narrow ovate and very shallow, while in Sowerby's species it is distinctly cordate and deeply impressed. The muscular impressions, though large, are much more shallow than in *N. pectinata*. The radiating costae of our species become obsolete on the lunule and escutcheon, and are about five times as broad as the grooves between, near the border. The anterior muscular impression is bordered by a distinct ridge, which extends nearly up to the beaks.

Locality and position. Moreau River, No. 5 of the series.

NUCULA PLANOMARGINATA. Shell ovate, somewhat compressed, pearly within; anterior end very short, obliquely truncate; posterior end long and narrowly rounded, dorsal and ventral margins forming, from the beaks backwards, elliptical curves; beaks much elevated; surface unknown; muscular impressions faint; border smooth. Length .95 inch; height .60 inch; breadth .26 inch.

We have only seen internal casts of this species, the shell being always left adhering to the matrix, from which we infer the surface was ornately marked. It may be at once distinguished from the last by its more compressed form and smooth border.

Locality and position. Same as last.

PECTENCULINA PARVULA. Shell very small, obliquely oval, somewhat compressed, inequilateral; buccal end and base rounded; anal extremity rounded and slightly extended obliquely downwards; cardinal border short, and having a narrow, well defined, longitudinally striate area on each valve; beaks small, not much elevated, about midway between the centre and the anterior end; surface polished and marked with lines of growth, sometimes crossed by faint indications of radiating costae; hinge having in each valve three or four teeth on each side of the central triangular ligamentary pit; interior marked with faint radiating grooves terminating in distinct crenulations at the border. Length .18 inch; breadth .10 inch; height .16 inch.

This little shell might, upon a hasty examination, be mistaken for *Cardium rærum*, (Evans and Shumard's unpublished MS.), but it possesses all the characters of the above genus. The shell is often so translucent that the internal radiating grooves are seen through it.

Locality and position. Yellow-stone River, No. 5 of the series.

ARCA (CUCULLÆA) CORDATA. Shell thick and strong, subovate, somewhat triangular or cordiform, very ventricose, abruptly rounded before, obliquely subtruncate behind, and forming a broad curve below; umbones gibbous, much elevated, incurved, located near the anterior end; ligamentary area very short, deeply excavated, grooved and finely striated longitudinally; surface marked with strong imbricating lines of growth and indistinct radiating costæ. Length 2.03 inches; breadth 1.77 inches; height 1.96 inches. Length of ligamentary area 1.25 inches; breadth of do. .30 inches.

This species, in its thickness and general appearance, approaches *Cucullæa Nebraskaensis*, (Owen,) but may be distinguished by its shorter buccal extremity, more elevated, approximate and incurved beaks, and especially by its much shorter and narrower ligamentary area. There is in our specimen a distinct sulcus starting from before the beak of each valve, and extending obliquely downwards to a point a little behind the middle of the shell, where it dies out before reaching the border. When viewed on either end, this shell presents a beautiful cordate form.

Locality and position. Moreau Trading Post, No. 5 of series.

ARCA (CUCULLÆA) SHUMARDI. Shell oval, ovate, somewhat globose, rather thin, obliquely subtruncate behind, rounded before, and forming an elliptic curve below; umbones very gibbous, oblique, moderately elevated, incurved, and located a little in advance of the centre; surface ornamented by distinct lines of growth, crossed by numerous, rather indistinct radiating costæ; ligamentary area straight, narrow, moderately excavated, grooved and striated longitudinally; hinge having in each valve three or four transversely striated, oblique, lateral teeth on each side, and small, irregular, intermediate transverse ones in the centre; border smooth. Length (specimen about four times the medium size) 1.67 inches; breadth 1.28 inches; height 1.40 inches.

This is one of the most abundant and beautiful bivalves found in the cretaceous rocks of the upper Missouri country. It varies much in form, some of the specimens being more nearly of an ovate form, in consequence of the anal region being extended, and the beaks more oblique, while others are shorter and more rotund. These two forms are quite well enough marked to constitute a specific distinction, if they were not connected by numerous intermediate ones. As these differences are not due to age or size, we are inclined to regard them as sexual. In old shells the radiating costæ are usually obsolete. In some specimens a single raised line may be seen passing from behind the beak of the right valve to the posterior border, following the direction of the raised edge of the posterior muscular impression. This is rarely seen on the left valve. We dedicate the species to Dr. B. F. Shumard, of St. Louis, Missouri.

Locality and position. Same as last.

MYTILUS ATTENUATUS. Shell much elongated, slightly arcuate; extremities compressed and rounded; anterior end narrow; beaks nearly terminal; surface (of cast) faintly marked with lines of growth. Length 1.90 inches; breadth .50 inch; height .56 inch.

From *M. Galpinianus* and *M. Meekii*, (Evans and Shumard,) this species may be known by its much greater proportional length and less gibbous beaks. Having only seen casts, we know nothing of its surface markings.

Locality and position. Same as last.

AVICULA ? FIBROSA. Shell ovate, subtriangular, very oblique, pointed at the beaks, somewhat rounded below; beaks small, acute, placed at the anterior extremity, and scarcely rising above the hinge; right and left valves alike, convexly arched from the beaks to the base; posterior wing somewhat flattened and apparently broadly rounded; surface ornamented by strong, rounded, radiating plications, which bifurcate very irregularly, and are crossed by strong concentric undulations, so as to give the surface, which is otherwise smooth, a subnodose appearance. Some of our specimens must have been as much as two inches in length when perfect.

It is with much doubt we place this shell in the above genus, as we have in none of our specimens seen any indications of an anterior wing. It is also worthy of note, that the substance of the shell is composed of an internal lamellar, and an external fibrous portion, like *Pinna*, from which, however, it differs in having a posterior wing-like expansion. The radiating costæ are faint or wanting on the wing.

Locality and position. Forks of Cheyenne River, No. 4 of series.

INOCERANUS VENTRICOSUS. Shell ovate, oval or oblong, extremely inflated, very thin and fragile, structure entirely fibrous; cardinal border straight; anterior end rounded, posterior end apparently subtruncate, base broadly curved; umbonal region remarkably gibbous; beaks oblique, located at the anterior extremity; surface marked with fine regular imbricating lines of growth, and occasionally with a few faint irregular concentric undulations. Length about 4.90 inches; breadth (of right valve) 1.70 inches; height 2.75 inches. Thickness of thickest part of shell, near the hinge, .12 inch; do. of thinnest part near border .03 of an inch.

The most striking characteristics of this species are its remarkably ventricose form, extreme thinness and entirely fibrous structure, there being no internal lamellar portion, as is generally the case in this genus. In our specimens the calcareous matter has been replaced by ferruginous and silicious matter, so as to preserve the original structure of the shell perfectly. If the left valve is as gibbous as the right, the transverse diameter of the shell must be considerably greater than its height. The beak of one of our specimens appears to have been truncated. We have only seen right valves.

Locality and position. Mouth of Judith River, in sandstone, supposed to be the same as No. 1 of the series.

Pecten Nebraskaensis. Superior valve suborbicular, moderately compressed, ornamented by twelve to fifteen strongly elevated costæ about equal to the spaces between; surface marked with very fine, closely arranged concentric lines, crossed by equally fine crowded radiating striae; buccal ear (imperfect in our specimens) apparently triangular, rather distinctly marked with radiating costæ, crossed by concentric striae stronger than on the body of the valve; annal ear smaller, triangular, concave on the margin, and marked with distinct concentric lines. Length and breadth .49 inch.

From *P. venustus* of Dr. Morton, (Synopsis, pl. 5, fig. 5.) to which this species appears to be closely allied, it may be distinguished by the fine radiating striae. In some of the specimens the costæ occasionally bifurcate, while the radiating striae never run exactly parallel to the costæ, but pass very obliquely along their sides. These striae are so fine as to be invisible without the aid of a lens. We have not seen the inferior valve.

Locality and position. Yellow-stone River, one hundred and fifty miles from its mouth, in a bed supposed to represent No. 5 of the series.

Natica subcrassa. Shell obliquely oval or oblong, thick; spire rather short; volutions three to three and a half, convex; suture distinct or somewhat grooved; surface marked with strong lines of growth, which rise, on the body whorl, into distinct imbricating wrinkles; outer lip bevelled; inner lip rather thick, and nearly covering the small umbilicus; aperture ovate, oval, or elliptical, nearly as obtusely rounded above as below. Length .95 inch; breadth .87 inch; apical angle about 93°.

It is possible there may have been other surface markings than those mentioned above, as all our specimens are so worn that fine lines would have been obliterated, had they existed. The species may be known from those found in the higher members of the series in this region, by its stronger lines of growth, and greater thickness.

Locality and position. Mouth of Judith River, from a sandstone supposed to be the same as No. 1 of the series, where it is associated with *Tritina gracilis*, and *T. equilateralis*.

Notices of Remains of Extinct Mammalia, discovered by Dr. F. V. Hayden, in Nebraska Territory.

By JOSEPH LEIDY, M. D.

PACHYDERMATA.

1. *LEPTOCHORRUS SPECTABILIS*, Leidy.

The genus and species are proposed upon a small fragment of the lower jaw of an apparent suilline animal, containing two molar teeth, which appear to be the first and second true molars. The crowns of these teeth have the general form of the corresponding ones of the Peccary, and they are composed of four tubercles or lobes confluent into a thick base, with a ridge anteriorly and posteriorly, and between the outer lobes externally. Of the four lobes that postero-internal is the largest, the external pair are nearly equal, and the antero-internal one is smallest. The inner lobes are trilateral, and the outer ones are much like the corresponding lobes of ruminants. The aims of the crescentoid summits of the outer lobes join the inner lobes; that most anteriorly joining the antero-internal lobe, while the other three join the postero-internal lobe.

Antero-posterior diameter of first true molar	2½ lines.
Transverse, do. do. do.	2 "
Antero-posterior, do. second do.	3 "
Transverse, do. do. do.	2½ "

Discovered in the Mauvaises Terres of Nebraska.

RUMINANTIA.

2. *LEPTAUCHENIA DECORA*, Leidy.

In Dr. Hayden's collection there are several specimens from the valley of White River, Nebraska, consisting of fragments of upper and lower jaws with teeth, which belonged to a ruminating animal allied to the Camel.

One of the fragments contains the left superior true molars and the last premolar. The true molars have their crowns more nearly square than in either the Camel or Lama, and the anterior folds of their outer lobes are produced relatively much more outwardly and forwards than in either of the latter. The surfaces between the folds are concave and directed much more obliquely backward than in the Camel. The last pre-molar is bilobed and holds the same relation of position of its outer face to the true molars as in the Camel.

In several fragments of lower jaws containing the last two true molars, and in another with the anterior two true molars, these teeth have a strong resemblance to the corresponding teeth of the Camel.

Another fragment of a lower jaw discovered by Dr. Hayden, on Bear Creek, Nebraska, appears to belong to the same animal as the former, though this may not be the fact. It contains the alveoli for three incisors, a canine, and three premolars. The incisive alveoli are in close relationship as in the Lama. The canine is separated from the former by a hiatus of less than one line, and it has nearly the form of the corresponding tooth in the Camel. Posterior to the canine and separated from it by a hiatus of less than two lines, there is a portion of the first premolar, which appears to have had nearly the same form as the canine. The succeeding two premolars are separated from the first by a hiatus of a little more than four lines. These are inserted by two fangs, are in close contiguity, and have broad, laterally compressed, pyramidal crowns, bearing considerable resemblance to the premolars of the Musks.

Length of series of upper true molars and last premolar	15½ lines.
Antero-posterior diameter of second true molar	5 do.
Transverse do. do.	5½ do.
Length of series of lower true molars	15½ do.
Antero-posterior diameter of last true molar	7 do.
Depth of lower jaw below do.	11 do.
Depth of lower jaw below second premolar	10 do.
Breadth of crown of third premolar	4½ do.
Breadth of crown of second premolar	4 do.

CETACEA HERBIVORA.

3. *ISCHYROTHERIUM ANTIQUUS*, Leidy.

This genus and species are proposed upon numerous fragments of bones, consisting of two vertebral bodies, the half of a third specimen, several transverse processes, and portions of ribs, discovered by Dr. Hayden, in an out-lier of a lignite formation, between the Moreau and Grand rivers, Nebraska.

The bones are as dense and heavy as those of *Manatus*, to which the genus appears to be most nearly allied. The vertebral bodies, apparently posterior dorsal, are transversely oval in outline; and are perforated at the sides and lower part by large canals converging towards their centre. The anterior and posterior articular surfaces are slightly depressed, as are also the sides of the body. The upper part of the latter, on each side of the position of the spinal canal, presents a large, rugged concavity, about an inch and a quarter in diameter, apparently for articulating with the transverse processes. These latter are antero-posteriorly flattened, cylindrical and curved. Their vertebral extremity is furnished with a convex rugged surface, corresponding to the concavities on the vertebral bodies, and above this surface is a smooth one forming the side of the vertebral canal, and overhung by an abutment for the articular and spinous processes.

The ribs are cylindroid and tapering towards the broken ends of the specimens, and they are quite as dense in structure as those of *Manatus*.

Length of vertebral bodies	.	.	.	1½ inches.
Transverse diameter of do.	.	.	.	2½ "
Vertical do.	do.	.	.	3 "

RODENTIA.

4. *STENOXYBES NEBRASCENSIS*, Leidy.

This species is established upon several specimens, consisting of a much mutilated skull and several fragments of upper and lower jaws with teeth. The skull appears to have the same form as that of *Stenoxibes vicinensis*, but is between a fourth and third less in size. The dental formula is the same as in the latter, that is, in.

1—1 4—4
 — m — = 20. The molar teeth resemble those of *S.*
 1—1 4—4

vicinensis.

Length of skull of <i>S. nebrascensis</i>	.	.	2½ inches.
Length of lower jaw	.	.	1½ "
Length of upper molar series	.	.	7 lines.
Length of lower molar series	.	.	8 "

From the valley of White River, Nebraska.

5. *ISCHYOMYS TYPOS*, Leidy.

A new genus and species established upon the greater portion of a skull and two fragments of lower jaws. The cranium bears considerable resemblance of form to that of *Stenoxibes*. Formula of dentition as follows:—

1—1 5—5
 in. — m. — = 32. The molars have cuboidal crowns and are in-

series by distinct fangs. The upper ones bear some resemblance to those of *Arctomys*; but the lower ones are more like those above.

Estimated length of skull	.	.	2½ inches.
Length of upper molar series	.	.	7½ lines.
Length of lower molar series	.	.	8 "

From the Bad Lands of Nebraska.

6. *PALAEOLAGUS HAYDENI*, Leidy. --

The genus and species are founded upon numerous small fragments of jaws, containing molar teeth, of a rodent allied to the Hares. The formula of the

6 6
 molar dentition is the same as in the latter, —. The molars are con-
 5—5

structed like those of the Hares. The first inferior molar is bi-lobed and not tri-lobed as in the latter. The number of incisors cannot be ascertained in the specimens. Those inferior have much longer roots than in the Hares, as they extend back beneath the molar teeth.

Length of superior molar series $4\frac{1}{2}$ lines, 6 lines, 7 lines.

Length of inferior molar series 5 lines, 8 lines.

Found in the Mauvaises Terres of Nebraska.

7. EUMYS ELEGANS, Leidy.

The genus and species are founded upon a fragment of the lower jaw, containing the middle molar, and the fangs of two others. The estimated size of the skull would be about that of the Rat, (*Mus decumanus*), and the animal also appears to belong to the same family. The molar series of the lower jaw consists of three teeth, and they have exerted crowns inserted by distinct roots.

Length of lower molar series, - - - - $3\frac{1}{2}$ lines.

Depth of lower jaw below middle molar, - - - $2\frac{1}{4}$ lines.

Discovered in the Mauvaises Terres of Nebraska.

CARNIVORA.

8. AMPHICYON ? GRACILIS, Leidy.

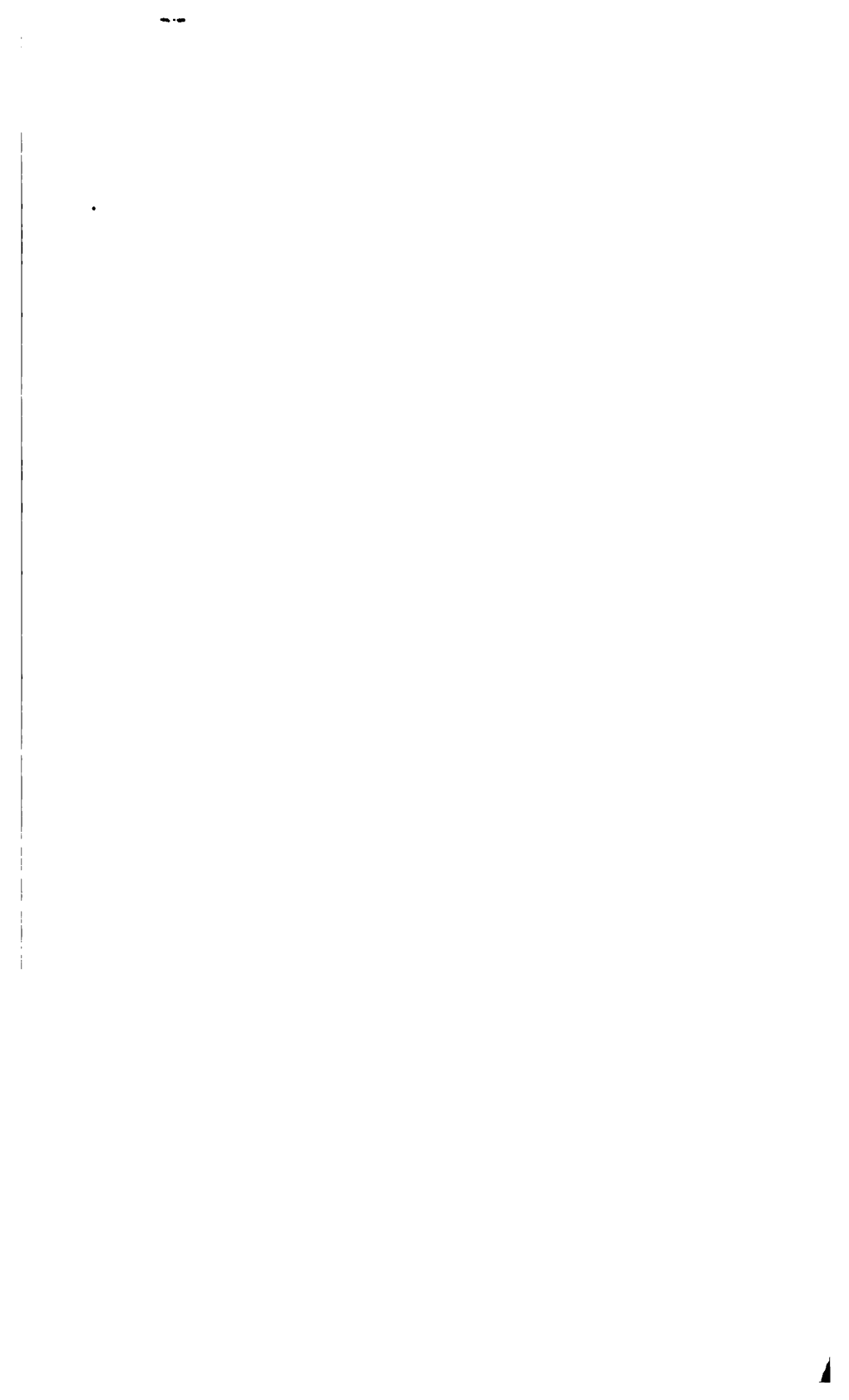
A small species of this genus is probably indicated by a specimen in Dr. Hayden's collection, consisting of a fragment of the lower jaw containing two teeth, of which one corresponds in form with the antepenultimate molar of *Amphicyon major* DeBl. or of *A. vetus* Leidy, and the other, being the tooth in advance, has nearly the same form as the corresponding tooth in the wolf. The length of the crown of the antepenultimate tooth is $2\frac{1}{4}$ lines, its breadth $4\frac{1}{4}$ lines; and the depth of the lower jaw is 5 lines.

The specimen was discovered by Dr. Hayden, in association with remains of *Anchitherium*, *Hypopotamus*, *Hyaenodon*, etc. in Nebraska.

Notice of the remains of a species of Seal, from the Post-pliocene deposit of the Ottawa River.

By JOSEPH LEIDY, M. D.

E. Billings, Esq., of Ottawa, West Canada, recently sent to the Academy, for the inspection of its members and for description, a specimen consisting of a slab or portion of a concretion of indurated clay, containing some imbedded bones, which Mr. B. observes, in a letter accompanying the specimen, "appear to him to be those of the extremities of a small animal of aquatic habit." Mr. B. further states, "the specimen was discovered by Mr. Peter McArthur, in a bed of blue clay containing boulders and marine shells and fishes. The locality is in the township of Gloucester, county of Carleton, Canada West, about nine miles east of the city of Ottawa. From this city the river Ottawa runs easterly for about sixty miles, in a channel excavated through a bed of the glacial drift, composed in some places of clay, and in others of sand, gravel and boulders. Where the specimen was discovered, the bank of the river is of clay about thirty feet high, at the time of low water. The water washes out of the bank numerous nodules of the clay, which are consolidated into a pretty hard kind of stone. Many of these nodules, when split open, are found to contain shells, or the skeletons of fishes, often beautifully preserved. The species of shells found up to the present time are *Tellina groenlandica*, *Mytilus edulis*, *Saxicava rugosa*, and a small rostrated one like a *Leda*; and of fishes two species, *Mollotus villosus* and *Cyclopterus lumpus*. They also contain leaves of trees, broken twigs and grass, showing that there was land at no great distance. There is a ridge of low metamorphic hills on the north shore of the river, extending for a great distance parallel with and near the stream. On the south side the country is level, and underlaid with lower Silurian rocks, Utica slate, Trenton, Black River, Bird's-eye and Chazy limestones, with here and there a strip of the lower rocks brought up to the





A. Procyon

surface by undulations. I think there was an ancient valley excavated in these rocks before the period of the drift, that it was filled up during that period, and that the river is now cleaning it out again."

The bones referred to prove, on examination, to be those of the greater portion of the hinder extremities of a young seal, but whether of a species distinct from those now found living in the neighboring seas, is a question only to be determined by careful comparison with the corresponding parts of the recent animals. The soft distal extremities of the tibia and fibula are crushed together. The bones of the ankle and foot are well preserved, but the epiphyses of the latter are separated and only partially developed. The matrix in the vicinity of the bones, is marked by the impressions of the hairs and skin which enveloped them.

Mr. Logan, in a report on the "Geological Survey of Canada," (1850, '51, p. 8.) refers the deposit, in which the above described specimen was found, and similar deposits of the St. Lawrence and its tributaries, to the post-tertiary period; and he further observes, that in these deposits, "the remains of whales, seals, and two species of fishes, and many marine shells of those species still inhabiting the Gulf of St. Lawrence, are found;" from which remarks, together with those of Mr. Billings, and the appearance of the fossil itself, we are inclined to suspect the seal of the Ottawa has its descendants yet sporting on the sea border of the Canadas.

Independent of all other considerations, the specimen is interesting, as exhibiting the same process at the present geological period, which for so many successive ages has preserved the remains of vegetables and animals, which are now examined by the palaeontologist as so many iconographic illustrations of life in the history of our planet.

Plate III. Representation, two-thirds the size of nature, of the greater portion of the bones of the hinder extremities of a young seal, partially imbedded in one-half of a concretion of indurated clay, from a post-pliocene deposit of the Ottawa River, Canada.

Notices of several genera of extinct Mammalia, previously less perfectly characterized.

By JOSEPH LEIDY, M. D.

CARNIVORA.

1. *DEINICTIS*, Leidy.

Skull intermediate in form to that of *Felis* and *Machairodus*. Orbits more open posteriorly than in either of these genera; and the anterior extremity of the lower jaw constructed as in the latter. Formula of dentition as in *Putorius*, viz.

$$\begin{array}{ccccccc} 3-3 & 1-1 & 2-2 & 1-1 & 1-1 & & \\ \text{in.} & \text{c.} & \text{p.m.} & \text{car. m.} & \text{tub. m.} & = & 32. \\ 3-3 & 1-1 & 3-3 & 1-1 & 1-1 & & \end{array}$$

Incisors relatively as well developed as in *Felis*, with the lower ones arranged as in *Putorius*. Canines like those of *Machairodus*. First premolars small, those succeeding robust with the upper pair bilobed, and the lower ones trilobed. Carnassial molars like those of *Machairodus primævus*. Lower tubercular molar like that of *Putorius*; the upper one thickest at its outer part.

DEINICTIS FELINA, Leidy. Pr. A. N. S. vii, 127, 156. A unique species, with the skull about the size of that of *Machairodus primævus*, or about a fifth smaller than the Panther, (*Felis concolor*.)

Locality. Mauvaisnes Torres of Nebraska.

PACHYDERMATA.

2. *HYRACODON*, Leidy.

Skull without horns; with the cranium surmounted by a long and narrow sagittal crest; orbits better defined from the temporal fossæ than in *Rhinoceros*; nasal bones articulating with the intermaxillaries, and deeply notched at their

free ends. Lower jaw intermediate in form to that of *Rhinoceros* and *Tapirus*. Formula of dentition as in the latter, viz.,

$$\begin{array}{ccccccc} 3-3 & 1-1 & & 4-4 & & 3-3 & \\ \text{in.} & \text{c.} & \text{p. m.} & & \text{t. m.} & & \\ 3-3 & 1-1 & & 4-4 & & 3-3 & \end{array} = 44.$$

The incisors and canines are arranged in semicircles as in *Tapirus*, differ little in size, and have simple conical crowns. The premolars and molars resemble those of *Acerotherium incisivum*.

HYRACODON NEBRASCENSIS, Leidy.

Rhinoceros nebrascensis, Leidy. Pr. A. N. S. v, 121; vii, 157; Owen's Rep. Geol. Surv., Wisc. 556; Anc. Faun. Nebr. 86.

Acerotherium nebrascense, Leidy. Pr. A. N. S. v, 331.

A unique species, possessing a greater number of teeth than any other known member of the *Rhinoceros* family. It was about the size of the common hog.

Locality. Mauvaises Terres of Nebraska.

3. *TITANOTHERIUM*, Leidy.

Formula of dentition as follows:

$$\begin{array}{ccccccc} 2-2 & 1-1 & & 4-4 & & 3-3 & \\ \text{in.} & \text{c.} & \text{p. m.} & & \text{t. m.} & & \\ ?-? & 1-1 & & 4-4 & & 3-3 & \end{array} =$$

The molars are separated from the canines by wide intervals. The latter teeth have short, robust, conoidal crowns. Outer lobes of the premolars like those of *Rhinoceros*, the inner ones isolated from the former and connate. Outer lobes of the true molars like those of *Palaeotherium*; the inner ones three in number, of which the intermediate one is conical and is the largest, and the others are trihedral, as in *Chalicotherium*.

TITANOTHERIUM PROUTHI, Leidy. Auc. Faun. Nebr. 72; Pr. A. N. S. vii, 157.

Palaeotherium, Cuv. Prout. Am. Jour. Sci. Arts iii, 248.

Palaeotherium? Proutii, Owen, Norwood, and Evans. Pr. A. N. S. v, 66; Leidy, Ibidem 122; Owen's Rep. Geol. Surv. Wisc. 551.

Rhinoceros? americanus, Leidy. Pr. A. N. S. vi, 2.

Eotherium americanum, Leidy. Pr. A. N. S. vi, 392.

Palaeotherium giganteum, Leidy. Anc. Faun. Nebr. 78.

A unique species, and one of the largest of pachyderms. Length of the upper dental series in a straight line 17 inches; transverse diameter of second true molar $3\frac{1}{4}$ inches, antero-posterior diameter the same.

Locality. Mauvaises Terres of Nebraska.

Description of Twenty-five New Species of Exotic UNIONES.

By ISAAC LEA.

UNIO HAINESIANUS. Testâ alată, lævi, subrotundatâ, subinflâtâ, valdè inæquilatèrali, valvulis crassiss; natibus prominentibus, angulatis; epidermide luteo-fuscâ; dentibus cardinalibus crassiss, crenulatis elevatisque; lateralibus longis, crassiss subcurvisque; margaritâ albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UNIO MYERSIANUS. Testâ bialatâ, lævi, triangulari, subcompressâ, inæquilatèrali, posticè angulatâ; valvulis crassiss; natibus prominulis epidermide tenebroso-fuscâ; dentibus cardinalibus longis crenulatisque; lateralibus prælongis, lamellatis subcurvisque; margaritâ colore salmonis tinctâ.

Hab. Siam. S. R. House, M. D.

UNIO HOUSEI. Testâ bialatâ, lævi, triangulari, compressâ, valdè inæquilatèrali, posticè obtusè angulatâ, valvulis subcrassiss; natibus prominulis; epidermide fuscâ; dentibus cardinalibus lamellatis; lateralibus prælongis, lamellatis subcurvisque; margaritâ colore salmonis tinctâ.

Hab. Siam. S. R. House, M. D.

UXIO GRAVITUS. Testâ alatâ, lævi, triangulari, valdè inflatâ, valdè inæquilaterali; valvulis tenuibus; natibus elevatis, tumidis; epidermide luteâ, nitidâ; dentibus cardinalibus prælongis, valdè lamellatis; lateralibus longis, lamellatis subcurvisque; margaritâ cæruleo-albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UXIO INORNATUS. Testâ lævi, ellipticâ, inflatâ, subæquilaterali, posticè subangulatâ; valvulis sub-pellucidis tenuibusque; natibus subprominentibus; epidermide olivaceâ, substriatâ; dentibus cardinalibus longis lamellatisque lateralibus longis rectis, lamellatisque; margaritâ cæruleo-albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UXIO LUTENS. Testâ lævi, ellipticâ, inflatâ, subæquilaterali, posticè obtusè angulatâ; valvulis crassis; natibus subprominentibus; epidermide luteâ, politâ; dentibus cardinalibus crassis brevisque; lateralibus brevis, subcrassis subrectisque; margaritâ albâ et iridescente.

Hab. Newville Burmah. Mrs. Vinton.

UXIO EXIMICA. Testâ alatâ, plicatâ, obovatâ, compressâ, valdè inæquilaterali, posticè rotundatâ; valvulis tenuissimis; natibus prominulis; epidermide virido-luteâ, obsoletè radiatâ; dentibus cardinalibus longis lamellatisque; lateralibus longis, lamellatis subcurvisque; margaritâ cæruleo-albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UXIO TENDICUS. Testâ lævi, obliquâ, inflatâ, posticè angulatâ, valdè inæquilaterali; valvulis subcrassis; natibus prominentibus; epidermide tenebroso-olivaceâ, striatâ; dentibus cardinalibus longis lamellatisque; lateralibus prælongis subcurvisque; margaritâ albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UXIO RUSTICUS. Testâ tuberculatâ, ellipticâ, inflatâ, inæquilaterali, posticè subangulatâ; valvulis subcrassis; natibus subprominentibus; epidermide olivaceâ, substriatâ; dentibus cardinalibus longis lamellatisque; lateralibus longis, lamellatis subrectisque; margaritâ albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UXIO SAGITTARIUS. Testâ lævi, valdè transversâ, valdè inæquilaterali, subinfatâ, subcylindraceâ, posticè acuto-angulatâ; valvulis subtenuibus; natibus vix prominentibus; epidermide virido-olivaceâ, striatâ; dentibus cardinalibus longis, rectis lamellatisque; lateralibus prælongis subrectisque; margaritâ albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UXIO SUBSTRIATUS. Testâ lævi, ellipticâ, subinfatâ, subæquilaterali; posticè angulatâ, anticè rotundatâ; valvulis crassiusculis; natibus subprominentibus granulatisque; epidermide olivaceâ radiatâ et rugoso-striatâ; dentibus cardinalibus longis, rectis lamellatisque; lateralibus longis, rectis lamellatisque; margaritâ argenteâ et iridescente.

Hab. Siam. S. R. House, M. D.

UXIO SCOBINATUS. Testâ plicatâ, transversâ, in medio compressâ, valdè inæquilaterali, posticè angulatâ, ad basim emarginatâ; valvulis subcrassis; natibus parvis, prominulis, ad apicem undulatis; epidermide viridi et luteâ, minutè striatâ; dentibus cardinalibus obliquis, compressis; lateralibus prælongis, in uterque valvis duplicis subrectisque; margaritâ albâ et iridescente.

Hab. Siam. T. R. Ingalls, M. D., S. R. House, M. D.

UXIO HUMILIS. Testâ plicatâ, transversâ, subinfatâ, subæquilaterali, subcylindraceâ, posticè biangulatâ; valvulis tenuibus, pellucidis; natibus prominulis, perplicatis; epidermide virido-luteâ, striatâ; dentibus cardinalibus lamellatis rectisque; lateralibus longis lamellatisque; margaritâ cæruleo-albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UNIO PHASSELUS. Testâ plicatâ, transversâ, inflatâ, subemarginatâ, valdè inæquilaterali, posticè obtusè angulatâ; valvulis crassis; natibus parvis, prominulis, ad apicem undulatis; epidermide viridi et luteâ, politâ; dentibus cardinalibus brevis subcrassisque; lateralibus prelongis, duplicis in uterque valvis subcurvisque; margaritâ albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UNIO VERREAULIUS. Testâ sulcatâ, oblongâ, inflatâ, subemarginatâ, subæquilaterali, posticè obtusè angulatâ; valvulis crassis; natibus parvis, subprominentibus undulatisque; epidermide luteo-bruneâ, striatâ dentibus cardinalibus magnis, obliquis, compressis crenulatisque; lateralibus longis, rectis lamellatisque; margaritâ salmonis colore tinctâ et iridescente.

Hab. Cape of Good Hope. Mr. E. Verreaux.

UNIO AFRICANUS. Testâ lævi, ellipticâ, subcompressâ, subemarginatâ, valdè inæquilaterali, posticè obtusè angulatâ; valvulis subtenuibus; natibus parvis, prominulis undulatisque; epidermide luteo-olivaceâ et politâ; dentibus cardinalibus parvis, obliquis, compressis sublamellatisque; lateralibus prelongis subrectisque; margaritâ salmonis colore tinctâ et valdè iridescente.

Hab. Cape of Good Hope. Mr. E. Verreaux.

UNIO SHURTLEFFIANUS. Testâ minutè plicatâ, ellipticâ, inæquilaterali, subcylindraceâ, posticè obtusè angulatâ, anticè rotundatâ, ad latus subplanulatâ; valvulis subcrassis; natibus prominulis, ad apices minutè undulatis; epidermide virido-luteâ; dentibus cardinalibus sublongis, compressis geminisque; lateralibus longis subrectisque; margaritâ salmonis colore tinctâ et iridescente.

Hab. Sina River, India, Major Le Conte. Ahmednugger, India. S. Shurtleff, M. D.

UNIO EFFULGENS. Testâ sulcatâ, ellipticâ, subinflatâ, inæquilaterali, posticè obtusè angulatâ; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscâ, politâ; dentibus cardinalibus parvis crenulatisque; lateralibus longis curvisque; margaritâ cæruleo-albâ.

Hab. Brazil. E. W. Budd, M. D.

UNIO DUNKERIANUS. Testâ plicatâ, transversâ, subinflatâ, valdè inæquilaterali, posticè obtusè angulatâ; valvulis subtenuibus; natibus prominulis, costis divaricatis; epidermide tenebroso-fuscâ politâque; dentibus cardinalibus longis compressisque; lateralibus prelongis, lamellatis rectisque; margaritâ cæruleo-albâ et valdè iridescente.

Hab. River Macacoâ; Rio de Janeiro, Brazil, Prof. Dünker. New Grenada, Mr. E. Verreaux.

UNIO SHUTTLEWORTHII. Testâ sulcatâ, oblongâ, transversâ, valdè inæquilaterali, subcompressâ, posticè obtusè biangulatâ, ad latus planulatâ; valvulis subcrassis; natibus prominulis; epidermide bruno-nigricante; dentibus cardinalibus parvis; lateralibus longis subcurvisque; margaritâ purpureâ et iridescente.

Hab. Australia. R. J. Shuttleworth, Esq. Berne, Switzerland.

UNIO NUOLBUS. Testâ plicatâ, quadratâ, inflatâ, subæquilaterali, posticè angulatâ; valvulis crassis; natibus prominentibus, perplicatis; epidermide virido-fuscâ, minutissimè perstriatâ; dentibus cardinalibus crassis brevisque; lateralibus crassis, brevis, duplicis in uterque valvis subcurvisque; margaritâ cæruleo-albâ et iridescente.

Hab. Siam. S. R. House, M. D.

UNIO WHEATLEYANUS. Testâ lævi, ellipticâ, inflatâ, inæquilaterali; valvulis crassis; natibus prominulis, costis elevatis, epidermide tenebroso-olivâ, rugoso-striatâ; dentibus cardinalibus magnis, crassiusculis, subdivisis; lateralibus longis crassisque; margaritâ vel albâ vel carneâ et iridescente.

Hab. Rio Plata, M. A. D'Orbigny. Rio Negro. C. M. Wheatley, Esq.

Uro BROWNII. Testâ lævi, obovatâ, valdè compressâ, valdè inæquilaterali; valvulis subcrassis; natibus prominulis, costis divaricatis; epidermide tenebrosos-viridi, striatâ; dentibus cardinalibus submagnis, in utraque valvis duplicis; lateralibus lamellatis, sublongis curvisque; margaritâ albâ.

Hab. Mocha? Asia. Capt. George Brown.

Uro SCAVIDIUS. Testâ lævi, oblongâ, subcompressâ, valdè inæquilaterali; anticè rotundatâ, posticè truncatâ, natibus subprominentibus, costis elevatis; epidermide luteo-olivâ, minutè striatâ; dentibus cardinalibus parvis, compressis, crenulatis, in utraque valvis duplicis, lateralibus longis, lamellatis subrectisque; margaritâ cæruleo-albâ et iridescente.

Hab. River Amazon. Mr. E. Verreux, Paris.

Uro EMERSONI. Testâ lævi, ellipticâ, subinflatâ, inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide castaneâ, politâ, transversè fasciatâ; dentibus cardinalibus magnis, subelevatis; lateralibus longis, lamellatis sub-curvisque; margaritâ vel purpureâ vel rosâ et iridescente.

Hab. Medellin River, Mexico. M. Burrough, M. D.

Description of a new Snake from Illinois.

By ROBERT KENNICOTT.

REGINA KIRTLANDII.

The body of this species is somewhat trigonal in cross sections, (flattened on the abdomen,) and tapers gently from the middle to either extremity. There is no distinction of neck, and the very small head calls to mind that of the *Coleler amarus* of Say. It is, however, much larger, and the scales are very strongly carinated. The carinae are found on all the longitudinal rows of scales, of which there are nineteen exclusive of the belly scales; the external row is almost as sharply keeled as those on the back, even to the tip of the tail. The dorsal scales are narrow and elongated, the sides nearly parallel except near the ends.

As already stated, the head is very small. The vertical plate is sub-hexagonal, the two anterior sides forming a very obtuse angle; the external edges are slightly convergent posteriorly. The nostrils in the middle of the two plates. There is one ante-orbital and two post-orbitals; there are six labials above and seven below, in addition to the rostrals.

The ground color of this snake is a light purplish brown, with four rows of large nearly circular blotches covering the whole back and sides. They are arranged so as to alternate; the outer blotches on the outer row are a little larger than those on the two central ones, and are of the width of four or five scales. The belly is of a pale brick red, (fading to brownish yellow in alcohol,) with a well defined blotch of black near the exterior of each scale. These give rise to a series of very well defined round black spots on either side of the abdomen; and there is also an obscure series of dark blotches on the anterior edge of the scales in the exterior dorsal row. The dots in this series are separated by intervals of two unmarked scales. The spots of this row alternate with those of the larger series immediately above.

On separating the scales, the skin is seen to be colored like the adjacent scales. It is black in the dark blotches and very light in the intermediate space, giving rise to the appearance of whitish edges to the scales.

There are thus four series of large spots on the back and sides, two on the belly, and two in the exterior dorsal rows, making eight in all. The last mentioned row is sometimes very obscure, the others are always distinct.

I refer this serpent to the genus *Regina* of B. and G., although it is different in some respects from the other known species. It is somewhat like the *R. virida*, but is differently marked; the latter having the two abdominal rows close together on the middle of the belly, instead of being separated. Neither is there

any indication in *R. rigida* of the four series of dorsal blotches. In fact, there is no North American species more strongly marked than this.

Abdominal scales 133, the last one divided; subcaudal 59. Dorsal rows of scales 19. Length $19\frac{1}{2}$ inches, of which the tail measures $4\frac{1}{2}$ inches.

As yet, this species has only been detected in Northern Illinois, where it is rarely met with. The few specimens obtained have been found in the woods, generally under logs.

This snake is rather sluggish, and, like *Regina Grahamii* of B. and G., is not very pugnacious.

In giving to this serpent the name of Dr. Kirtland, as a slight token of the respect due him, to whose enthusiastic and untiring devotion to Science the West owes so much, I would also make some expression of my personal gratitude to the honored teacher, whose kind encouragement and instruction led me to study Nature, by dedicating to him his pupil's first contribution to Science.

Description of several new genera and species of Fossil Fishes, from the Carboniferous Strata of Ohio.

By J. S. NEWBERRY, M. D.

MECOLEPIS Newberry.

Heterocercal lepidoids of small size. Body fusiform. Head obtuse. Tail elongated. Lobes very unequal. Fins small and provided with delicate fulcra. Dorsal opposite anal or nearly so, both set far back in body. Cranial surface ornamented by corrugations, tubercles or granulations. Opercular, maxillary and hyoid plates ornamented with convoluted corrugations of the surface in various patterns.

Scales smooth, or ornamented; posterior margin of lateral scales all or in part serrated. Scales of median line above and below characteristically angled or crenulated. Two rows of scales on sides extending back to near anal fin, remarkably high, vertical 2 to 5 times longitudinal diameter.

Lateral line nearly straight, passing the upper part of lower row of high scales.

Teeth conical, short, *en brosse*.

The peculiar group of fishes to which I have given the generic name of *Mecolepis*, apparently represents the *Paleonisci* in the ichthyic fauna of the locality where they occur. From *Amblypterus* and *Elonichthys* they may readily be distinguished by their small fins all bearing fulcra. With *Paleoniscus* their affinities are closer, but the ensemble of characters presented by the large number of specimens which I have examined, seem to separate them from that genus. Among these diagnostic characters the most conspicuous are their small size, posterior position of dorsal fin and especially the high lateral scales.

1. *M. CORRUGATUS* Newb. Body fusiform, robust. Length 3 in. 4 lines; breadth 10 lines. Length of head 8 lines. Anterior lateral scales $2\frac{1}{2}$ times as high as long. Cranial plates ornamented by convolutions of fine, thread-like corrugations. Maxillary bones, opercular and hyoid plates corrugated much as superior surface of head. Scales smooth, except a few on the anterior dorsal surface, which are finely striate and punctate. Posterior margins of lateral scales as far back as anal and dorsal fins serrated. Scales of tail, like most of those of the dorsal and ventral surfaces, plain on surface and margins. Anterior margin of anal fin opposite centre of dorsal fin; longest rays of anal fin when collapsed just reaching base of caudal fin.

2. *M. TUBERCULATUS* Newb. Body fusiform. Entire length 3 inches. Head 6 lines. Tail 8 lines.

Cranial plates strongly tuberculated; tubercles rounded elongated and reniform. Surfaces of opercular, maxillary and hyoid bones covered with linear parallel corrugations.

Surface of all the scales of the body smooth, except a few on the anterior

dorsal and ventral surfaces, which are sometimes finely punctate. Lateral scales nearly 5 times as high as long. Posterior margins of lateral scales bearing a few serrations.

Anal fin opposite dorsal.

Radial formula,

D. 6; C. 14; A. 8?; V. 6; P. ?

3. *M. GRANCLATUS* Newb. Body fusiform, robust. Length 3 inches, breadth 7 lines. Head 6 lines long. Tail 9 lines.

Head tubercled above, tubercles elongated, with granulations between. Opercula, maxillaries and hyoid plates threaded.

Scales apparently thinner and more delicate than those of any other species. Those on anterior portion of body granulated, and having a faint double waved line along anterior margin. Posterior border serrated.

Lateral scales 4 times as high as long.

Radial formula,

D. 6; C. 14; A. 8; V. 5?; P. 9?

4. *M. LINEATUS* Newb. Body fusiform, robust. Length 3 inches; breadth 8 lines.

Cephalic bones all ornamented with thread-like lines, as in *M. corrugatus*, and without tubercles.

Scales of anterior portion of abdomen covered with concentric thread-lines. Margins of lateral scales ornamented in the same manner.

Lateral scales lower than in any other species yet discovered, greatest vertical diameter only twice longitudinal.

Scales of abdomen twice as long as broad.

5. *M. OVOIDENS* Newb. Fish small, robust. Body ovoid. Length 1 inch 6 lines; breadth 6 lines. Length of head $4\frac{1}{2}$ lines.

Cranial surface corrugated and finely granulated; opercula and lower parts of head ornamented by thread-like corrugations.

Scales of anterior portion of abdomen granulated, of sides serrated.

Lateral scales $3\frac{1}{2}$ times as high as long.

6. *M. ORNATISSIMUS* Newb. Fish small, fusiform, slender. Length 2 inches; breadth 5 lines.

Cranial surface sparsely tubercled, tubercles somewhat radiated. Spaces between tubercles finely granulated. Opercula, maxillaries and hyoid bones granulated and corrugated. All the scales of the body and tail ornamented with granulations, striae or denticles.

Lateral scales 4 times as high as long, with a double line of appressed denticles on anterior border, and acute serrations of posterior margin.

Fins all relatively longer than in other species. Dorsal fin nearly opposite anal.

7. *M. INSCULPTA* Newb. Body fusiform, slender. Length 2 in. 6 lines, breadth 5 lines.

Cranial plates ornamented with elongated tubercles, spaces between tubercles granulated. Sides and under surface of head marked by raised lines and fine granulations.

Scales on anterior half of body highly ornamented. Lateral scales $3\frac{1}{2}$ times as high as long, and having a doubled wave line along anterior margin, with acicular denticulations of posterior border.

Scales of abdomen having entire surface covered with appressed denticles.

8. Scales of tail and posterior portion of body plain.

Dorsal fin opposite anal.

8. *M. SERRATUS* Newb. Small, robust. Length 1 in. 6 lines. Head 4 lines. Tail 5 lines. Breadth of body 5 lines.

Head finely tubercled above. Opercula, maxillaries and hyoid plates marked by fine linear corrugations.

Highest scales of sides 3 times as high as long. All lateral scales quite into the tail, strongly and sharply serrate on posterior margin. Surface of anterior scales wrinkled from the serrations forward.

Anterior margin of anal fin opposite posterior margin of dorsal.

ELONICHTHYS Giebel.

E. PELTIGERUS, Newb. Body short, compressed. Length 5 inches. Height 1 in. 6 lines. Breadth 1 inch. Cephalic bones all ornamented by parallel convolutions of thread lines. Scales all covered by similar raised lines, which cross them diagonally downward and backward, terminating in serrations of the posterior margins.

About the middle of the interval between the occiput and dorsal fin, on the median line, begins a row of oval scales, four times as large as the scales of the sides; ornamented in the same manner, extending in a single row along the median line to the dorsal fin, and behind the dorsal fin to the tail, where they are transformed into the large striated fulcra, which overlie the prolongation of the vertebral to its termination.

These abnormal scales of the dorsal line are a striking peculiarity in the species, and have suggested the name given it.

CÆLACANTHUS Agass.

1. *C. ROBUSTUS* Newb. Body robust, 1 foot 6 inches in length. Upper surface of cranium covered with small closely approximated tubercles; maxillaries and opercula threaded with fine parallel, sometimes interrupted lines. Margins of opercula in mature specimens wavy.

Scales elliptical, thin, 7 to 9 lines in length, nearly half the surface exposed; exposed portion covered with thread-like lines similar to those of the opercula and maxillaries, and which converge toward the posterior angle of the scale.

C. ORNATUS, Newb. Body fusiform, slender, scarcely wider than head. Size small, not exceeding 4 to 5 inches in length. Upper surface of head ornamented with tubercles, which are much larger and more remote than in preceding species. Opercula and maxillaries threaded, and like the scales having stronger markings than in the larger species.

Radial formula,

A. D. 8; P. D. 5; C. 24?; A. 6; V. ?; P. ?

C. ELEGANS Newb. Body fusiform, robust, 6 to 8 inches in length. Cranial surface covered with closely approximated tubercles. Surface of opercular and maxillary bones threaded. All the ornamenting of head relatively stronger than in *C. robustus*, but less so than in *C. ornatus*. Scales similar in form and markings to those of both these species, but more delicate than either. Anterior dorsal fin slightly in advance of ventrals. Posterior dorsal as much forward of anal fin.

Radial formula. A. D. 7?; P. D. 5; C. 22; A. 6; V. 9?

PYGOPTERUS Agass.

P. SCUTELLATUS Newb. Body fusiform, slender, 15 to 18 inches in length. Head depressed. Snout pointed. Both jaws thickly set with conical, slender, acute, striated teeth of unequal size. Scales very small and thick, higher than long. Head and anterior portion of body covered with articulated plates ornamented with strong, radiating, raised lines. None of my specimens show the form of the caudal fin.

This fish presents such striking differences in its scales and plates from all described species of *Pygopterus*, that I have hesitated about placing it in that genus. It would seem, however, to have much in common with *P. Grenockii* Agass., not yet fully described.

RHIZODUS Owen.

R. LANCEOLATUS Newb. Teeth striated below. Section elliptical, smooth toward the summit, where they are very much compressed, with a lenticular section and cutting edge on both sides. Form of summit of tooth like that of a lance head. Near the apex of the tooth the cutting edge of one side is slightly gibbous, an apparent tendency toward a barbing of the point, as in some species of *Lepidosteus*.

As usually found, the plicated base of the tooth has mostly disappeared, the solid point alone remaining; this is about an inch in length. The entire tooth was more than twice that length.

R. INCURVUS Newb. Head massive. Superficial bones strongly tuberculated. Tubercles elongated, vermicular, sometimes becoming elevated lines of a line in breadth, and having a radiated arrangement. Jaws strong, both thickly set with strong ancipital curved teeth. These teeth are striated below, elliptical in section, and toward the summit curved backward toward the throat. They are of different sizes, as in all allied fishes. The smaller teeth are 6 to 9 lines in length and thickly set; the larger ones are much fewer in number, and more than twice as long. One of the larger teeth is placed near the extremity of the lower dentary bone of each side, as in *R. gracilis* McCoy.

R. ANGUSTUS Newb. Laniary teeth elongated, slender, finely striated at base, smooth above, with cutting edges. Subordinate teeth half the length of the larger ones. Conical, acute, striated at base, with a circular section throughout. Surface of jaw coarsely tubercled.

In this diversity of form in the teeth, this species differs from *R. gracilis* McCoy and from *R. Hibberti* Ag., as well as from the other species I have found in Ohio. In *R. incurvus* N., however, the teeth have a section so nearly circular that there seems no good reason for separating them by generic distinctions.

Of all the species of *Rhizodus*, which I have found, I probably have scales and perhaps vertebrae and cranial plates, but as yet have been unable to find these organs connected with the teeth.

DIPLODUS Agass.

D. COMPRESSUS Newb. Teeth of moderate size, base small. Lateral denticles unequally spreading, compressed, with acute points and strongly crenulated edges. Central denticle very small, acute, compressed, finely crenulated on margin.

D. CRACILLUS Newb. Teeth as large as *D. gibbosus* Agass. Base very small. Lateral denticles long, curved, slender, divergent towards the points, much less compressed than in preceding species, less acute, and less conspicuously crenulate on margins. Median denticle small, subulate, scarcely crenulate on margins.

D. LATUS Newb. Teeth very large and very robust. Lateral denticles nearly straight, and on the same plane, divergent, $\frac{1}{3}$ to $\frac{1}{2}$ as broad at base as long, compressed. Each margin strongly crenulated. Middle cone obsolete, or reduced to a simple knob. Base of tooth large, under surface flat.

All the specimens of *Diplodus* from Ohio which have come under my observation, numbering some hundreds, have crenulated margins, in that respect presenting a striking difference from the species described by Agassiz.

CLADODES Agass.

C. ACUMINATUS Newb. Central denticle elongated, conical, acute; lateral denticles very acute, compressed. Base small and thin.

CHIRODUS McCoy.

C. ACUTUS Newb. Teeth as long as *C. parvulus* McCoy, but more slender throughout. Denticles more acute.

CLEMAXODUS McCoy.

C. brevis Newb. Teeth oval, in form, shorter than *C. imbricatus* McCoy. Ridges which cross the surface more remote, with sharp crests and sinuous outline.

PLEURACANTHUS Agass.

P. biserialis Newb. Spine straight, strong, tapering rapidly to a moderately acute termination. Length four inches; diameter at base 4 lines. Anterior face rounded; posterior face nearly flat. Entire surface finely striated longitudinally. Sides flattened, joining posterior surface at right angles. At angle on each side a double row of small, closely set, acuminate, depressed hooks. On the upper part of the spine the hooks are arranged in a single row. Side of spine at base of the hooks marked by a distinct longitudinal furrow.

P. arcuatus Newb. Spine slightly curved backward, rapidly tapering to an acute point. Anterior surface rounded; posterior face nearly flat. At angle formed by the junction of sides with posterior face is, on each side, a single row of closely set, acuminate, depressed hooks. Anterior surface marked with fine longitudinal striae.

P. dilatatus Newb. Spine short, robust, one inch six lines long, straight, acuminate at summit, largest near middle, contracted at base. Anterior face rounded; posterior face flattened, and bearing at the angles on either side a row of minute depressed hooks. Surface smooth.

COMPSACANTHUS Newb.

Spines of small size, very neat in form and finish. Section at all points circular. A single row of relatively large, remote, depressed hooks is set along the posterior median line.

Of this genus I have probably but one species.

C. levis Newb. Spine slender, curved, acuminate, having a circular section at all points; upper two-thirds furnished with a single row of depressed acuminate hooks remotely set along median line of posterior surface.

On motion of Mr. Cassin, a Committee was appointed to prepare a list of Correspondents for publication. The following compose the Committee: Mr. Cassin, Dr. Le Conte and Dr. Leidy.

ELECTION.

Dr. R. A. Penrose and Mr. Wm. H. Patterson, of Philadelphia, were elected *Members*, and Mr. F. B. Meek, of Albany, was elected a *Correspondent*.

May 6th, 1856.

Vice-President BRIDGES in the Chair.

Mr. Durand presented for publication in the Journal a paper, entitled, "*Plantæ Kaneanæ Arcticæ et Polaris. An Enumeration of the Plants collected by Dr. E. K. Kane, U. S. N., in his first and second voyages to the Polar Regions, with descriptions and remarks;*" which was referred to a Committee consisting of Drs. Zantzinger, Bridges, and Uhler.

Dr. Hallowell remarked that the most abundant of the urodèles in the neighborhood of Philadelphia, is the *Plethodon* (*Desmognathus*, Bd.) *niger*, which may be said to exist by thousands. It is found under stones along the borders of rivulets near the banks of the Schuylkill, and is very quick in its movements, its capture demanding close attention and much activity. It appears to be endowed with a higher degree of vitality than the other caducibranchiates with which it is associated. Its transformation is sooner effected; specimens one inch and a half in length, being without gills, while the larvæ of *Pseudotriton ruber* are found more than three inches in length.

The *Salamandra quadrimaculata* of Prof. Holbrook is identical with this animal; the red spots are observed in quite young specimens as well as those more mature, but disappear with age. It is very abundant, a large proportion of the specimens being thus spotted.

The urodèles most frequently met with in the neighborhood of Philadelphia after the *niger* are *Pseudotriton ruber* and *Plethodon erythronotus*. The former occurs in the same localities with the *niger*, but is much less active, though perhaps more tenacious of life. The young are of a bright red color spotted with black; as age advances the color deepens, resembling spanish brown (*maculata*, Green,) and in very old specimens is of an almost purple color; the younger larvæ are white, the older olive colored with dark spots.

At the present time, April 28th, 1856, the females of both *Plethodon niger* and *Pseudotriton ruber* are distended with eggs,* as many as seventy being counted in the ovaries of the former. They are of a yellow color, about a line in diameter; none are to be seen in the oviducts; the number of eggs is not always the same in both ovaries, being sometimes considerably greater in one than the other. The eggs in many of the specimens of *Pseudotriton ruber* are immature, perfectly white and quite small. In the stomach of one of the latter a large lumbricus was found, in another the remains of a coleopterous insect, and in a third the tail and posterior extremities of a Salamander, probably a young *Plethodon niger*.

Spelerpes (*Cylindrosoma*, Tsch.) *billneata*, is found in the same neighborhood, and also *Plethodon erythronotus*, the latter under stones, at some distance from the water, associated with *Plethodon cinereus*. In one specimen the stripe along the back was of a beautiful pink color.

May 13th.

Vice-President BRIDGES in the Chair.

Letters were read—

From Mr. F. B. Meek, dated Albany, 10th May, 1856, acknowledging his election as a Correspondent of the Academy.

From Mr. Edward Tuckerman, dated Amherst, 3d May, 1856, transmitting the collection of Plants acknowledged at the last meeting.

From E. Billings, Esq., dated Ottawa, West Canada, 6th May, 1856,

* June 26th, females of *niger* in same condition

transmitting the first numbers of the "Canadian Naturalist and Geologist," and desiring exchange. This letter was referred to the Committee on Proceedings.

From Mr. Abraham Sager, dated Ann Harbor, Michigan, 5th May, 1856, transmitting for publication in the Proceedings, a paper, entitled, "Descriptions of Articulata, supposed to be new;" which was referred to a Committee consisting of Drs. Leidy, Hallowell, and Bridges.

Mr. Isaac Lea presented a paper for publication in the Proceedings, entitled, "Descriptions of four New Species of Exotic Uniones;" which was referred to a Committee consisting of Drs. Wilson and Bridges, and Mr. Hanson.

Mr. Charles E. Smith remarked in relation to the specimens of iron ore presented by himself this evening, that the three leading varieties of the ore, known as the Baltimore ore, were shown in the specimens. The bed lies on the west side of Chesapeake Bay, runs parallel with it, and is about fifty miles long. It is of white clay underlying the Eocene deposit. The ore lies in nodules like the brown hæmatite. In the most valuable bed, this ore is associated with large quantities of mineral charcoal, which seems to be always in broken masses. Mr. S. had never seen any traces of plants. There is no other deposit of iron ore in the neighborhood. The iron made from this ore is remarkable for its great strength. Mr. S. considered the deposit as remarkable, being the only one of which he was aware, in which the lithoid carbonate of iron exists out of the coal measures.

May 20th.

Mr. ORD, President, in the Chair.

Dr. Bridges, referring to the specimens of lithoid carbonate of iron exhibited at the last meeting, gave the following as the probable theory of the formation of this ore. Iron pyrites by exposure would be converted into a sulphate of the protoxide with some sesquioxide of iron. By contact with lime these oxides would be precipitated, the protoxide rapidly becoming sesquioxide. The contact of organic matter would reduce the sesquioxide again to protoxide, which would combine with the carbonic acid evolved during the fermentation of the organic matter.

Mr. Cassin announced the arrival in this country and the presence this evening of the Baron Von Müller, who proposes to visit Texas, Mexico, and Central America, and who is desirous of affording to the Academy any aid in his power.

Dr. Leidy remarked that he had just returned from a visit to St. Louis, and thought that the members would be gratified to learn that an "Academy of Science" had been organized in that city, whose objects were similar to our own. The Academy commences under the most promising prospects; and it occupies a highly favorable position in our country for the formation of a cabinet of natural history. It has recently received a large and very valuable collection of fossils, obtained by Dr. F. V. Hayden from the region of the Upper Missouri.

The collection consists of numerous remains of Mammalia and Chelonia from the Mauvaises Terres of Nebraska, a large number of mollusca from the cretaceous beds, and an extensive series of plants from a tertiary formation. Dr. C. A. Pope, with his usual liberality, has granted the Academy the use of a large hall furnished with cases, for the purposes of a museum, in the Medical College. The president of the Academy, than whom none could be more worthy, is Dr. George Engleman. In conclusion, Dr L. offered in furtherance of the objects of the new Academy the following :

Resolved, That this Academy present to the Academy of Science of St. Louis the second series of the Journal and the Proceedings.

Mr. Lea announced the death of Dr. John C. Warren, of Boston, a Correspondent of the Academy, *ætat.* 79 years.

Dr. Leidy offered the following resolution which was adopted :

Resolved, That the State Medical Society, shortly to hold its session in this city, be invited to visit the Museum of the Academy on the last Wednesday of this month.

May 27th.

Vice-President BRIDGES in the Chair.

The Committee on Mr. Durand's paper, read 6th inst., reported in favor of publication in the Journal.

The Committee on Mr. Lea's paper, read 18th inst., reported in favor of publication in the Proceedings.

Description of four New Species of Exotic Uniones.

By ISAAC LEA.

UNIO COLORADOENSIS. Testâ lævi, ellipticâ, inflatâ, valdè inæquilaterali; valvulis crassis; natibus elevatis magnisque; epidermide luteo-castaneâ, obscure radiatâ et politâ; dentibus cardinalibus magnis, duplicis, acuminatis crenulatisque; lateralibus magnis prælongis, lamellatis subcurvisque; margaritâ purpurâ et iridescente.

Hab. Rio Colorado, Texas. B. W. Budd, M. D.

UNIO NUTTALLIANUS. Testâ lævi, ellipticâ, subinflatâ, inæquilaterali; valvulis tenuibus; natibus prominulis; epidermide olivaceâ, eradiatâ, valdè politâ; dentibus cardinalibus parvis, rectis, compressis crenulatisque; lateralibus subcurtis, subrectis lamellatisque; margaritâ salmonis colore tinctâ et iridescente.

Hab. India. Prof. Thomas Nuttall.

UNIO CAMBODIENSIS. Testâ lævi, ellipticâ, subinflatâ, inæquilaterali; valvulis subtennibus; natibus prominentibus, ad apicem undulatis; epidermide castaneâ, eradiatâ, politâ; dentibus cardinalibus longis, rectis lamellatisque; lateralibus prælongis, lamellatis subrectisque; margaritâ albâ et iridescente.

Hab. Takrong river at Korat, Cambodia. S. R. House, M. D.

UNIO NEWCOMBIANUS. Testâ corrugato-sulcatâ, rotundatâ, subcompressâ, inæquilaterali; valvulis crassis; natibus elevatis prominentibusque; epidermide tenebroso-olivaceâ, corrugatâ; dentibus cardinalibus submagnis, duplicis subcompressisque; lateralibus subbrevis, crassis subcurvisque; margaritâ albâ.

Hab. Lake Nicaragua. W. Newcomb, M. D.

The Report of the Corresponding Secretary for the last month was read and adopted.

June 3d.

Vice-President BRIDGES in the Chair.

Letters were read—

From the Imperial Society of Naturalists of Moscow, dated August 13th, 1855 ;

From the Royal Imperial Geological Institute of Vienna, dated 23d September, 1855 ;

From the Senckenberg Natural History Society, dated February, 1856 ; and

From George Frauenfeld, dated Vienna, 12th December, 1855, severally announcing donations.

From Prof. Karl Koch, Secretary of the Society for the Advancement of Horticulture, dated Berlin, 6th February, 1856, acknowledging the receipt of the Proceedings, transmitting donations, and desiring exchange. Referred to the Publication Committee.

From the Royal Academy of Sciences of Amsterdam, dated 15th January, 1856 ; and

From the K. L. C. Academy of Sciences of Breslau, dated 30th January, 1856, severally acknowledging the receipt of the Journal and Proceedings.

From the Royal Bavarian Academy of Sciences, dated Munich, January 20th, 1856, acknowledging the receipt of the publications of the Academy, and requesting a duplicate set.

From the Senckenberg Natural History Society, dated February, 1856, acknowledging donations.

From the Academy of Science of St. Louis, dated 24th May, 1856, requesting donations of works on Natural History.

Mr. Isaac Lea read a paper, entitled, "Description of thirteen species of Exotic Peristomata;" which was referred to a Committee consisting of Drs. Hallowell, Corse, and J. A. Meigs.

June 10th.

Vice-President BRIDGES in the Chair.

A letter, dated September, 1855, was read from Jas. R. Eckert and Frederick S. Eckert, Executors of the Estate of the late James Read, presenting his herbarium and certain botanical works.

A paper was presented for publication in the Journal, entitled, "A Commentary on the 'Synopsis Fungorum in America Boreali media degentium, by L. D. de Schweinitz.' By the Rev. M. J. Berkeley, M. A., F. L. S., and the Rev. M. A. Curtis, F. A. A. S.;" which was referred to a Committee consisting of Dr. Zantsinger, Mr. Durand, and Dr. Bridges.

A paper was presented for publication in the Proceedings, entitled, "Descriptions of New Species of Acephala and Gasteropoda from the Tertiary formations of Nebraska Territory, with some general remarks on the Geology of the country about the sources of the Missouri river. By F. B. Meek and F. V. Hayden, M. D.;" which was referred to a Committee consisting of Dr. Leidy, Mr. Lea, and Mr. Charles E. Smith.

Dr. Leidy announced that the skeleton of the White Bear presented by Dr. E. K. Kane, had been mounted and placed in the Museum.

Dr. Leidy observed that A. Vogt, a frog and leech catcher, who frequently accompanied Dr. Hallowell and himself when in pursuit of objects of Natural History, informed them that the severe cold of the previous winter had destroyed great numbers of frogs and turtles. Dr. L. also expressed the opinion that the house-flies were much less numerous this season than last; a fact which he was inclined to attribute to the destruction of their larvæ by the severe and protracted cold of the preceding winter months.

Dr. Bridges thought that the shade trees of our city suffered less than usual from the span-worm.

On leave granted, Dr. Leidy offered the following, which was unanimously adopted:

Resolved, That casts in plaster of the skulls of *Bootherium cavifrons* and *Megalonyx Jeffersonii*, be presented to the Boston Natural History Society, the British Museum, and the Zoological Museums of the Jardin des Plantes, Paris, and of Berlin, Prussia.

June 17th.

Mr. LEA, Vice-President, in the Chair.

A letter was read from Mr. George Gibbs, dated Fort Steilacoom, Washington Territory, May 6th, 1856, acknowledging his election to membership.

A paper was presented for publication in the Proceedings, entitled, "Contributions to the Ichthyology of the Western Coast of the United States, from specimens in the Museum of the Smithsonian Institution. By Charles Girard, M. D.;" which was referred to a Committee consisting of Drs. Wilson and Hallowell, and Mr. Vaux.

A paper was presented for publication in the Proceedings, entitled, "Ceratites Americanus. By Prof. L. Harper, of the University of Mississippi;" which was referred to Dr. Leidy and Messrs. Lea and A. H. Smith.

A paper was presented for publication in the Proceedings, entitled, "Examination of the Meteoric Iron from Xiquipilco, Mexico. By W. J. Taylor;" which was referred to a Committee consisting of Mr. Vaux, Dr. Genth, and Mr. S. Ashmead.

Dr. Hallowell presented for publication in the Proceedings, a paper, entitled, "Description of two New Species of Urodèles from Georgia;" which was referred to a Committee consisting of Major Le Conte, and Drs. Bridges and Leidy.

Dr. Hallowell remarked that we had recently received through Mr. Vogt, a large collection of living specimens of *Sternotherus odoratus*, Holb., from the neighborhood of Philadelphia, more than thirty in number. Many of them present important characteristics not hitherto noticed. The larger as well as a number of the smaller specimens, are of a chocolate brown or olive color above upon the carapax, with numerous black spots, the sternum brown, mingled with yellow; iris golden; upper part of head olive, with numerous small dark colored maculae; two yellow vittae, passing one above, the other beneath the eye; barbels in both sexes. The differences between the male and the female are strongly marked, and may be presented as follows:

Male.

Sternum more narrow and more concave; tail much larger; shell more depressed, especially in its posterior half; portion of sternum behind abdominal plates, more quadrangular in shape.

Dimensions. Length of carapax $4\frac{1}{2}$ inches (Fr.); breadth at middle 3 inches; length of sternum 3 inches; greatest breadth 2 inches.

Posterior part of sternum slightly moveable in both, much less moveable than the anterior; both male and female provided with scales upon the posterior part of the hinder extremities; carapax of both sexes spotted.

Habitat. Found abundantly near Philadelphia.

Female.

Shorter ($\frac{1}{2}$ an inch) carapax higher, broader and more oval; outline of disk oval, somewhat compressed at the sides; snout more acute; gular plate more elongated; anal scutes longer, posterior axillary plates larger.

Dimensions. Length of carapax 4 inches; breadth 3 inches; length of sternum 3 inches 3 lines; greatest breadth 2 inches, 3 lines.

*Young. Differences between male and female.***Male.**

Carapax of male more tectiform; narrow in front, broader posteriorly; outline of shell less distinctly oval; portion of sternum posterior to abdominal plates more quadrangular, tail much larger.

Dimensions. Length of carapax 3 inches 7 lines; greatest breadth $2\frac{1}{2}$ inches; length of sternum $2\frac{1}{2}$ inches; greatest breadth 2 inches 5 lines; greatest length of posterior part of carapax behind abdominal plates 1 inch 1 line; distance between posterior margin of anal scutes and posterior margin of marginal plates $7\frac{1}{2}$ lines.

Both sexes ash color, brown or olive above, with numerous dark colored spots; sternum yellow, or black, or brown mingled with yellow; soft parts beneath ash mingled with white, yellowish or reddish mingled with yellow; head olive colored; two yellow vittae, one passing above, the other beneath the eye; iris golden; barbels in both sexes and scales upon the posterior part of the hinder extremities.

Habitat. Same as former; hibernate in great numbers together, Mr. Vogt having turned out 239 from one hole. They are associated in hibernating with *Tropidonotus sipedon* and *ordinatus*, and *Rana pipiens* or Bull frog; never with the *Chelonura serpentina*, or snapper, which is always found alone.

Younger specimens. Shell strongly carinated and marked with dark colored radiating lines resembling in form those of *Unio radiata*; no spots; contour of shell in females oval; specimens $2\frac{1}{2}$ inches and 2 lines in length.

The varieties indicated above may be described as follows:—

Type. Predominating color, dusky ash above, with marblings of yellow, more especially along the sides; head olive, with a few small yellow spots; no yellow

lines above or beneath the eyes; pupil black; iris golden; sternum black, several of the plates tipped with yellowish; marginal scutes narrow, except the four posterior, which are broad (Adult.) In younger specimens the yellow lines above and below the eyes are manifest; shell ash, spotted with black; sternum yellow, mingled with black, sometimes without spots; very young specimens with radiating lines of black upon the carapax; length of shell 3 inches 10 lines.

Var. *a*. Carapax olive, with numerous black spots; posterior terminal marginal plates larger than the others; an orange-colored line above and one below the eyes; iris golden; sternum yellow and black mingled; soft parts ash colored, with a tinge of red and yellow; younger specimens presenting the same general appearance; shell inclining to brown above; sternum yellow. (K. guttatum, LeConte.)

Length of shell 3 inches 7 lines.

Var. *g*. Shell dark spanish brown above, with numerous dark colored spots; sternum black, mingled with yellow; soft parts greyish.

Length of shell 4 inches 4 lines.

The *Kinosternum guttatum* of Major LeConte appears to be a variety of *Staurotypus odoratus*, var. *a*. Dr. Holbrook's plate represents a young ash-colored female. Schoepf's figure is also that of a female more advanced but not fully grown. (Tab. 24, *β*.) Hist. Testudinum. Erlaoge, 1752.*

We believe Duméril and Bibron to be right in putting the animal above described in the genus *Staurotypus*.

Cinosternon pennsylvanicum differs from *Staurotypus odoratus* in the much greater mobility of the posterior portion of the sternum, the animal being able to close itself up, almost like a box tortoise, in the greater extent therefore to which the sternum covers the ventral surface, in the marked differences in the shape of the sternal scutes, which, with the exception of the abdominal, are more or less triangular in *pennsylvanicum*, in the larger size of the inguinal plates, in the shape and coloration of the head, in the form and arrangement of the posterior marginal plates, and in the configuration of the carapax.

Staurotypus† belongs to the family of Elodites of Dum. and Bib. or Paludine Turtles, which are placed immediately after the Chersites or Land Tortoises. These are subdivided into two subfamilies—the *Cryptoderes* and *Pleuroderes*—the first having the power of withdrawing the neck under the middle of the carapax. It comprises seven genera, viz.: *Cistuda*, *Emys*, *Tetronyx*, *Platysternon*, *Emysaurus*, *Staurotypus* and *Cinosternon*.

The second sub-family, or that of the *Pleuroderes*, which have the power of withdrawing the neck to one of the sides of the anterior opening of the carapax, and never completely between the arms and under the middle of the carapax, as in the *Cryptoderes*, comprises also seven genera, viz., *Peltocephalus*, *Podocnemis*, *Pentonyx*, *Sternotherus*, *Platemys*, *Chelodina*, *Chelys*. It will be observed, therefore, that *Staurotypus* and *Sternotherus* belong to different subfamilies, for which reason we prefer to designate this animal as Duméril and Bibron have done by Wagler's name of *Staurotypus*, the latter being a *Cryptodere*; besides, *Sternotherus* has no nuchal plate, and is destitute of axillary and inguinal plates. The marginal scutes are 24 in number. The sternum is not cruciform, as in *Staurotypus*, the anterior valve (the only one) and the abdominal plates enclosing the animal leaving the posterior parts more or less exposed, the posterior part of the sternum being immoveable, or nearly so, as in *Staurotypus*. Dumeril and Bibron also point out an anatomical difference of importance between the *Cryptoderes* and *Pleuroderes*, viz., that in the latter the pelvis is solidly fixed to both the sternum and carapax; whereas, in the former, it is "articulated to the internal face of the carapax by a cartilaginous symphysis, corresponding to the sacral bone, being entirely free towards the sternum, permitting several of

* Mr. Gray, Major LeConte and the Prince de Canino, place it in *Cinosternon*; Prof. Holbrook and Mr. Bell, in *Sternotherus*.

† *Σταυρε*, cross, and *τυτις*, type—sternum cruciform.

these Chelonians to move slightly this portion of their bony apparatus." The celebrated authors above mentioned describe but two species of *Staurotypus*, viz., *triporcatatus* and *odoratus*. Of the former we have a specimen from the river Medellin, in Mexico, the carapax of which, measures 11 inches (Fr.) in length and 7 in breadth, being much larger than the specimen in the Jardin des Plantes. The sternum is cruciform and has but 7 plates, there being eleven in *odoratus*. but when we consider that these animals correspond in the shape of the head, the general configuration of the shell, and the *form of the sternum*, these differences may be considered specific, and not generic. The following are the characters of *Staurotypus*, *Cinosternon* and *Sternotherus*, as given by Dumeril and Bibron, (Tome 11, pp. 354, 361 and 396.)

Sub-Fam. CRYPTODERIDÆ.

Gen. STAUROTYPUS, Wagler.

Head subquadrangular, pyramidal, covered in front by a single, very thin plate; jaws more or less hooked; barbels under the chin; 23 marginal scutes; sternum thick, *cruciform*, moveable in front, provided with eight or eleven scuta; the axillary and inguinal plates contiguous, placed upon the sterno-costal sutures; anterior feet with five nails, posterior with four only. Two species.

CINOSTERNON, Wagler.

Head subquadrangular, pyramidal; a single rhomboidal plate upon the cranium; jaws slightly hooked; barbels under the chin; scales of the shell slightly imbricated; 23 marginal scutes; sternum *oval*, moveable in front and posteriorly upon a fixed piece, provided with eleven scales, with short, narrow, subhorizontal wings; a very large axillary, an inguinal still larger; tail long, (in the males,) unguiculated. (*Staurotypus* with a larger sternum, and the posterior part of the sternum movable.) Three species.

Sub-Fam. PLEURODERIDÆ.

Gen. STERNOTHERUS, Bell.

Head depressed, provided with plates; jaws not denticulated; *no nuchal plate*; sternum large, with very narrow lateral prolongations; *anterior portion of the plastron rounded, moveable*; five nails to each extremity. (Three species, all from *Madagascar*. We have three shells of this genus from W. Africa.)

On leave granted, Dr. Le Conte offered the following, which was unanimously adopted:

Resolved, That a special vote of thanks be presented by the Academy to Dr. E. K. Kane, U. S. Navy, for his numerous and valuable donations to the Museum of the Academy.

June 24th.

Vice President BRIDGES in the Chair.

The Committee on Messrs. Berkeley and Curtis' paper, read 10th inst. reported in favor of publication in the Journal.

The Committees on Mr. Sager's paper, read May 13th; on Mr. Lea's paper, read June 3d; on Messrs. Meek & Hayden's paper, read 10th inst.; on Prof. Harper's paper, read 17th inst.; and on Mr. Taylor's and Dr. Hallowell's papers, read same date, severally reported in favor of publication in the Proceedings.

Descriptions of three Myriapoda.

By AB. SAGER.

CRASPEDOSOMADÆ, Gray.

Gen. REASIA? Gr.

Sp. R. SPINOSA, Nob. Body consists of sixty or sixty-one segments, exclusive of the head and ultimate bivalve scale. Segments all marked with sharp longitudinal ridges, the size of which vary considerably. On each side and between the mesial line and stigmata, are seven nearly equal ridges, that border the mesial line somewhat lower than the rest. On the sides are three larger ones terminated with spines, between which there are two smaller and spineless ones; the superior spinous ridge is semi-double and connected with the stigmata; below these are nine or ten smaller ridges, gradually diminishing as they approach the basis of the feet; anterior and posterior segments about equal to the adjoining ones, head glabrous; eyes a black triangular patch at the outer base of the antennæ; body cylindrical, chestnut brown, with a paler dorsal line covering the two dorsal ridges, and a pale lateral line covering the series of the stigmata; feet and antennæ rufous. Differs from the Reasia of Gray in eyes, in a triangular instead of a linear spot, and from the Cylindrosoma of the same author in the distinctness of the ridges and not having a reniform eye spot.

Nearly allied to the *Julus lactarius* of Say.

Gen. STENONIA, Gr.

Sp. S. HIRPIDA, Nob. Body composed of seventeen double segments, distinctly divided on the dorsal mesial line. Body depressed, margins of segments quite prominent and curved forwards near the head, in the middle and posteriorly transverse or curved slightly backwards. Surface of each segment covered with five rows of distinct tubercles, arranged somewhat in quincuncial order. From the direction of the tubercles the lateral and posterior margins of each segment appear serrated. First cervical segment smaller than the next, rounded anteriorly, straight and narrower behind, and obliquely truncated on the sides. The posterior segment about equal to the next in length, is triangular, the apex armed with a stiff hair. Color pale red above, feet and ventral surface flesh colored.

Length 6". Under decayed logs.

Gen. STRIGANIA, Gr.

Sp. S. FULVA, Nob. Body somewhat depressed, slightly narrowed towards the extremities, smooth above, rough and villous on the sides and beneath; feet hairy; posterior pair equal in length and twice as large as the next; antennal segments obconical, except the last, which is elliptical, and as long as the two preceding ones. Alternate dorsal scutæ form a slight, obtuse, lateral process. Color fulvous above, fawn colored on the sides and beneath.

Approximates closely to the *Geophilus rubens* of Say.*Description of Thirteen New Species of Exotic PERISTOMATA.*

By ISAAC LEA.

PALUDINA HAINENIANA. Testâ ventricosâ-conoideâ, subglobosâ, ponderosâ, solidâ, viridi-pallidâ, artissimè umbilicatâ, levi; spirâ obtusâ, ad apicem carneâ; suturis valdè impressis; anfractibus senis, convexis, ultimo amplo; aperturâ magnâ, subrotundatâ, intus albidâ; columellâ albâ, crassâ, incurvatâ.

Hab. Siam. S. R. House, M.D.

PALUDINA UMBILICATA. Testâ carinatâ, obtusè conoideâ, viridi-bruncâ, subtenui, umbilicatâ, levi; spirâ obtusâ, babylonicâ; suturis linearibus; anfractibus senis, carinatis, supernè planulatis; aperturâ subrotundatâ, intus albidâ; umbilico spirâliter carinato; columellâ incurvatâ.

Hab. Takrong River, Siam. W. A. Haines.

PALUDINA CHINENSIS. Testâ carinată, pyramidată, rufo-castaneă, subcrassă, arctissimè umbilicatâ, striată; spiră elevată; suturis impressis; anfractibus septenis, planulatis, in medio carinatis, supernè geniculată; aperturâ subrotundâ, incurvatâ; labro angulato.

Hab. China. W. A. Haines.

PALUDINA SWAINSONIANA. Testâ globosâ, subsolidâ, tenebroso-iridi, arctissimè umbilicatâ, lævi; spiră obtusâ; suturis valdè impressis; anfractibus instar quinis, convexis; aperturâ rotundată, intus albidâ.

Hab. Siam. T. R. Ingalls, M.D.

PALUDINA INGALLSIANA. Testâ carinată, obtusè conoideă, tenebroso-iridi, tenui, umbilicatâ, nitidâ; spiră obtusâ; suturis linearibus, anfractibus senis, subplanulatis, minutissimè et transversè striatis; aperturâ rotundato-elliptică, infernè subangulată, intus cœruleo-albâ.

Hab. Siam. T. R. Ingalls, M.D.

BITHINIA SIAMENSIS. Testâ ovato-concoideă, palido-olivaceă, tenui, diaphanâ, nitidâ, lævi, arctissimè umbilicatâ; spiră subelevată; suturis linearibus; anfractibus instar senis, convexis; aperturâ ovato-rotundată, incrassată, supernè angulată, intus albidâ.

Operculo calcareo, extrinsecus striis concentricis, intus granulato.

Hab. Takrong River, Siam. S. R. House, M.D.

BITHINIA GLOBULA. Testâ globosâ, palido-olivaceă, tenui, diaphanâ, lævi; imperforată; spiră depressâ, ad apicè obtusâ; suturis impressis; anfractibus quaternis, ventricosi; aperturâ rotundată, incrassată, subreflexâ, supernè angulată, intus albidâ; columellâ incrassată.

Operculo calcareo lævi, marginatâ.

Hab. India. W. A. Haines.

PALUDOMUS MACULATA. Testâ ovato-conică, virido-luteă, brunneo-maculată, crassâ, imperforată, lævi; suturis valdè impressis; anfractibus instar quinis, convexis; aperturâ subrotundâ, intus albâ; columellâ per albâ, callosâ.

Hab. Ahmednugger, India. S. Shurtleff, M.D.

AMPULLARIA ACROSTOMA. Testâ subglobosâ, luteă, transversim vittatâ, crassâ, arcte perforată, lævi; spiră obtusâ; suturis vix profundis; anfractibus instar senis, convexis; aperturâ rotundo-elliptică, subreflexâ, intus aurantiâ et obsolete vittatâ; umbilico arctè compresso; columellâ crassâ.

Operculo corneo, pellucido, subtriangulari.

Hab. Carthagena. Col. Totten, J. C. Troutwine, Esq.

AMPULLARIA TURÆFORMIS. Testâ elongato-globosâ, tenebroso-fuscâ, transversim vittatâ, tenui, pellucidâ, latè umbilicatâ, lævi; spiră emersâ; suturis valdè profundis; anfractibus instar quinis, valdè convexis; aperturâ magnâ, subrotundâ, dilatată, luteo-albidâ, intus brunneo-vittatâ; umbilico magno; columellâ subcallosâ.

Hab. ———? M. Burrough, M.D.

AMPULLARIA GRACILIS. Testâ regulariter elliptică, luteo-olivaceă, transversim pervittatâ, subtenui, arctè umbilicatâ, lævi, nitidâ; spiră emersâ; suturis paulisper impressis; anfractibus instar senis, subconvexis; aperturâ ovată, intus tenebroso-brunneâ et obsolete vittatâ; labio acuto; umbilico actè compresso; columellâ lævi.

Hab. Siam. S. R. House, M.D.

AMPULLARIA TURBINIS. Testâ turbinată, luteo-iridi, transversim vittatâ, subcrassâ, imperforată, lævi; spiră valdè depressâ; suturis paulisper impressis; anfractibus instar quinis, valdè convexis; aperturâ pergrandi, elongato-ovată, vel albâ vel luteâ, intus vittatâ; labio acuto; columellâ valdè incurvatâ, incrassată.

Hab. Siam. S. R. House, M.D.

ASSIMINEA CARINATA. Testâ regulariter conică, luteă, vittatâ, subcrassâ umbilicatâ, levi; spirâ ad apicem acutâ; suturis paulisper impressis, infrâ lineatis; anfractibus instar septenis, planulatis; aperturâ elliptică, subcanaliculatâ, intus vittatâ; umbilico spiraliter carinato; columellâ incurvatâ ad basim subangulatâ.

Hab. Siam. S. R. House, M.D.

Descriptions of New Species of Acephala and Gasteropoda, from the Tertiary formations of Nebraska Territory, with some general remarks on the Geology of the country about the sources of the Missouri River.

By F. B. MEEK AND F. V. HAYDEN, M. D.

That portion of the great Tertiary basin from which the fossils described in the following paper were obtained, occupies an extensive area of country near the head waters of the Missouri, chiefly between the 46th and 49th parallels of north latitude, and the 100th, and 108th degree of longitude west from Greenwich. According to the Barometrical measurements made by the party charged with the exploration of the proposed northern route of the Pacific railroad, this district varies in its elevation from 1800 to 2700 feet above the present flow of the tidal wave.*

In regard to the geographical, topographical, and physical features of this country, its native tribes, its botany, zoology, &c., much interesting information was long since laid before the public by the reports of Lewis and Clark's and Long's expeditions, by Mr. Catlin, the Prince of New Wied, Mr. Nuttall and others. More recently, much information of a similar nature has been added by the report of the Pacific Railroad Survey. All these enterprising travellers mention the occurrence of sandstones, clays, lignite, &c., but without giving us much information in regard to the age of these formations, the extent of country occupied by them, or as to the character of their organic remains.

In 1849 Dr. John Evans traced a great Lignite formation from below Fort Clark, along the Missouri to a point twenty miles below the mouth of the Yellow Stone; and in 1850 Mr. Thaddeus A. Culbertson, who visited this country under the patronage of the Smithsonian Institution, saw this formation at two or three points above Fort Union. In a map accompanying a highly interesting memoir on the geology of the Hudson's Bay Territories, published recently by Mr. A. K. Labister, in the Journal of the Geological Society of London, a large area about the sources of the Missouri, is colored as Tertiary, but so as to convey an incorrect idea of the extent of country occupied by it. About the same time, Mr. Jules Marcou published in the Bulletin of the Geological Society of France, a memoir on the Geology of the United States and the British Provinces, accompanied by a map, on which he colors nearly all the country about the head waters of the Missouri as New Red Sandstone, surmounted along the west shore of that stream by Cretaceous outliers. Between this and the Black Hills he brings up to Cannon-ball River, from the White River basin, a continuous belt of Tertiary. West of this he places a belt of Jurassic, and along the supposed position of the Black Hills he runs a stripe of Eruptive and Metamorphic rocks, flanked on the east and west by Carboniferous formations. On the west side of the Black Hills he colors another extensive district of Jurassic. In all this Mr. Marcou is certainly mistaken, excepting in regard to the Eruptive and Metamorphic rocks of the Black Hills; there may also be Carboniferous formations there, but they have not yet been recognized as far north by two or three hundred miles, as laid down by him.

Leaving for a future occasion all local and other details, we now propose to give a brief general sketch of the extent and boundaries, as far as we can, of that portion of the great Tertiary lignite formation from which our fossils were collected, with a few remarks upon its probable age, and relations to the White River basin, as well as to the Cretaceous formations upon which it reposes.

* Some points not crossed by these explorers may be a few hundred feet higher.

Ascending the Missouri from Fort Pierre, we find on reaching a point five miles below Heart river, about the 47th parallel north, that the Cretaceous formations which are so conspicuous for many hundred miles along the river below, pass by a gentle north or north-west dip beneath the water level, to be succeeded on both sides of the river by Tertiary. Although this is the first point where the Tertiary beds come down to the water level, they are known to occupy the higher country back from the river, on the west side, as far south as the vicinity of *Sawacanna* or Moreau river, and still further west they go as far south as some of the north-west branches of the Cheyenne. Cannon-ball river, Watahoo, and other small tributaries, however, cut down to the Cretaceous beds some little distance back from the Missouri. On the east side of the Missouri the Tertiary is bounded on the south, nearly opposite the mouth of Cannon-ball river, by a range of upper Cretaceous hills bearing off to the north-east. South of the Moreau, a similar range, known as Fox Hills, extends from near the Missouri to about the 102° of west longitude, where it is interrupted by a small tributary of the Cheyenne. West of this small stream, the same range of upper Cretaceous hills, known perhaps by other local names, bears round to the north-west, crossing the head branches of the Little Missouri so as to strike the Yellow Stone river about ten miles below the mouth of Powder river; forming nearly all this distance the south and south-west boundaries of that portion of the great Tertiary basin lying in the immense bend formed by the Missouri and Yellow Stone rivers. To comprehend how this range of hills could traverse the country in this way, it must be borne in mind that the Black Hills are laid down on most of the published maps of this country as extending a long distance too far north.

Returning to the point near Heart river, from which we first set out, we find on ascending the Missouri, that the Cretaceous strata again rise to view at a few points not far below Fort Clark, but even here the country on each side is composed of Tertiary. It was at one of these localities the Prince of New Wied collected a nearly entire skeleton of *Mosasaurus Maximiliani* (Goldf.) From the vicinity of Fort Clark we know of no other place where the Cretaceous beds make their appearance until about twelve miles below the mouth of Milk river, (lat. 47° N. long. 104° W.) the country on both sides of the Missouri all this great distance being made up of Tertiary formations, the northern and eastern limits of which are unknown to us. Immediately along the margins of Milk river, Cretaceous beds are seen on both sides as far up as we have any knowledge of the country, though the higher country back from the river is Tertiary. From the point below the mouth of this stream on the Missouri, where the Cretaceous beds first make their appearance, they are seen to rise higher and higher as we ascend the Missouri, in consequence of their inclination to the east or north-east. On the north side of the Missouri, between it and Milk river, the higher portions of the country back from the Missouri, are also composed of Tertiary beds.

The same formations likewise occupy nearly all the country between the Missouri and Yellow Stone, as far west as the vicinity of Muscleshell river, where they thin out on the summits of Cretaceous hills. The hills, however, near the Missouri, between Milk and Muscleshell rivers, are also mainly Cretaceous, the Tertiary being for the most part worn away by atmospheric agencies.

On both sides of the Yellow Stone, only Tertiary strata are seen from near the mouth of Powder river as far up as the mouth of the Big Horn. How far beyond this they extend we do not know, though we have received Tertiary fossils from intelligent traders, collected as far up the Big Horn as one of its tributaries known as Little Horn river. From another point as far west on the Yellow Stone as Rose river, we received a few Cretaceous fossils. As to the limits of the Tertiary up Powder and Tongue rivers, we have no definite information. The traders say the same kind of lignite beds seen along the Yellow Stone, occur along the banks of the former as much as one hundred and fifty miles above its mouth.

The foregoing hasty sketch is given more with a view of showing the extent of country occupied by this great Tertiary lignite formation, than with any hope of conveying a definite idea of its precise limits. If it should prove to be

only a part of the same extensive fresh water lignite formation observed by Sir John Richardson on the Saskatchewan, of which we have little doubt, then it is highly probable the Lignite and Coal formations mentioned by Mr. Isbister as flanking the eastern slope of the Rocky Mountains, in the form of a continuous belt from the Saskatchewan to the Arctic Ocean, belong to the same epoch.

For the most part, these deposits in Nebraska consist of beds of gray, yellowish, whitish, and blue sand, sandstone, clay, &c., with alternating strata of lignite of variable purity, and carbonaceous matter mingled with much sand and clay. These beds of lignite often take fire spontaneously, from heat generated in the decomposition of iron pyrites, and burn for many years at a time, sending forth suffocating sulphurous vapors, and causing such an intense degree of heat as to fuse the contiguous clay and sand into masses presenting every degree of compactness, from that of obsidian to light vesicular lava. In some of the argillaceous beds, great numbers of beautiful fossil plants are found, a fine series of which was collected and placed for investigation in the hands of Dr. J. S. Newberry, the well known fossil botanist of Cleveland, Ohio. The remains of Mollusca collected from these formations, over a wide extent of country, present a remarkable uniformity of character, and as may be seen by the following paper, are all, excepting a few land shells, referable to genera usually found in fresh and brackish waters. It is an interesting fact that the most nearly allied living representatives of many of these species are now found inhabiting the streams of Southern Africa, Asia, China, and Siam, apparently indicating the existence of a tropical climate in these latitudes at as late a period as the Tertiary epoch.*

Although there can be no doubt that these deposits hold a rather low position in the Tertiary System, we have as yet been able to arrive at no very definite conclusions as to their exact synchronism with any particular minor subdivision of Tertiary, not having been able to identify any of the Mollusca found in them with those of any well marked geological horizon in other countries. Their general resemblance to the fossils of the Woolwich and Reading series of English geologists, as well as to those of the great Lignite formations of the south-east of France, would seem to point to the lower Eocene as their position. Yet it may be possible these resemblances have resulted from the action of precisely similar causes at a somewhat later period.

It is a little remarkable that these formations differ in many respects from those of the White river basin lying so near on the south. In the first place they generally contain more sand, are usually characterized by beds of lignite, and as yet have furnished no remains of Mammalia; while the White river basin is more argillaceous, appears to be destitute of lignite, and is well known to be one of the most remarkable repositories of extinct mammalian remains on the face of the globe. In addition to this, not one of the species of Mollusca in our collection from the Lignite formations, is identical with any of those described by Dr. Evans and Dr. Shumard from the White river basin.

Formations immediately beneath the Tertiary in this district.

It would seem that the change of physical conditions which closed the Cretaceous epoch and ushered in the Tertiary, in this part of the world at least, was gradual,—not violent. We find that even while the Cretaceous conditions still existed, (during the deposition of No. 5 of the series†) the approaching close of that state of things, and the coming of the Tertiary era, were foreshadowed by the introduction of *Pasciolaria*, *Pleurotoma*, and *Belomnitella*, with many shells of other genera, quite as near in their specific affinities to Tertiary as to Cretaceous

* We are under many obligations to Dr. Isaac Lea, of Philadelphia, for the privilege of comparing our fossil species with analogous forms in his magnificent collection of recent shells.

† For a section of the rocks of this country see a paper by James Hall and F. B. Meek in the Memoirs. Am. Acad. Arts and Sci. vol. 5, New Series. Likewise a paper by F. B. Meek and F. V. Hayden in Proceed. Acad. Nat. Sci. Phila., March 1856.

forms; while the sea was gradually becoming more shallow, as is shown by the increase of *Gasteropoda*. We even know from the presence of a few remains of *lycopodiaceous* plants, and an occasional unbroken leaf of some *exogenous* tree, that there was dry land at this time somewhere not very far away. Gradually, as we ascend in the series, the strictly marine animals disappear, and we meet with *Ostrea*, *Corbula*, and *Cerithium*, mingled in the same bed with *Melania*, *Paludina*, *Physa*, *Cyrena*, &c., ALL of Tertiary types; while a little higher in the series, we find at some places only the remains of land and fresh water mollusca.

From the above facts, especially the presence of *Pleurotoma*, *Fasciolaria*, and *Belemnitella*, in this upper member of the Cretaceous system of this country, we cannot think it represents any part of the Green Sand of English geologists. Numerous well marked Cretaceous forms show it cannot be Tertiary, consequently we think it must represent some portion of the true Chalk. We are by no means inclined, however, to adopt the views of M. Alcide D'Orbigny, who regards all the Cretaceous formations of the United States and Western Territories as referable to a later epoch than the Green Sand, as the next succeeding formation below that of which we have just been speaking. (No. 4 of the series), is characterized by numerous fossils of unquestionable Green Sand type. We think confusion has been created in tracing out the parallelism between American and European Cretaceous formations, by fossils from different positions in this country having been mingled together and described as if they occurred in the same bed.

Formations at the base of the Cretaceous Series of this district.

As previously stated, near the mouth of Milk river, Cretaceous strata which are not seen for a long distance below this on the Missouri, again rise to view. They consist of the upper two members of the series (No. 5 and No. 4) which, in consequence of their inclination to the east, are found to rise higher and higher as we ascend the river, so that nearly all the hills close to the Missouri, between Milk and Muscleshell rivers, consist of these formations. Some four or five miles below the mouth of Muscleshell river, a lower rock,—a sandstone,—rises above the water level. This is probably No. 1 of the series, No. 2 and No. 3 not being represented here. It is worthy of note that out of two species of *Maclra*, two of *Tellina*, two of *Inoceramus*, one of *Pholodomya*, two of *Natica*, and one *Baculite*, found in this rock, not one is known to occur in any of the higher formations, and some of these species are not unlike *Neocomien* forms.

In consequence of the increasing inclination of the strata, this last mentioned sandstone rises in the vicinity of North Mountain river as much as 250 feet above the Missouri. Here, or near this, begins a wild and desolate region, known as the *Mauvaises Terres* or Bad Lands of the Judith. At various places in these Bad Lands a sandstone similar to No. 1 was seen alternating with beds of clay and lignite, all of which are upheaved and much distorted. It was found impossible to devote to the examination of these formations time enough to determine their relations to the Cretaceous and Tertiary strata of this region, without running the risk of being cut off from the party and murdered by the Indians. Amongst a few fossils that were collected here, however, Prof. Leidy finds teeth which he refers to two or three genera of large *Saurians* allied to the *Iguanodon*, *Megalosaurus*, &c. There are also in the collection from some of these beds, one or two species of *Unio*, one or more of *Cyclas* or *Cyrena*, and a few crushed specimens of *Gasteropoda* like *Paludina* and *Melania*. From these facts, we are strongly inclined to think with Prof. Leidy, there may be here, at the base of the Cretaceous System, a fresh water formation like the Wealden. In as much, however, as there certainly are some outliers of fresh water Tertiary in these Bad Lands, we would suggest that it is barely possible these remains may belong to that epoch, though the shells appear to be all distinct species from those found in the Tertiary at all the other localities in this region.

We remember seeing in 1853, between the mouth of Big Sioux and Platt rivers on the Missouri, some exposures very similar to those of the Bad Lands of the Judith, excepting that there appeared to be no beds of Lignite. We saw

no fossils in these beds, but were at that time impressed with the opinion that they belonged to the lower part of No. 1, which is well exposed a little higher up the river at the mouth of the Big Sioux, but soon dips beneath the water level to be seen no more between there and the far distant point already mentioned, near the mouth of Muscleshell river.*

DESCRIPTIONS OF SPECIES.

CYCLAS FORMOSA.

Shell small, oval, oblique, scarcely ventricose; cardinal margin straight buccal end rounded; anal extremity obliquely truncate; basal margin semi-elliptical or broadly rounded; beaks obtuse, tumid, rising somewhat above the hinge, nearly touching, placed a little in advance of the middle; surface ornamented by very fine, regular, distinct, concentric wrinkles. Length .17 inch; breadth .08 inch; height .14 inch.

Locality. Three miles above Fort Union.

CYCLAS FRAGILIS.

Shell small, subcircular, slightly oblique, scarcely ventricose, very thin and fragile; extremities and base rounded; posterior end wider than the anterior; beaks moderately elevated, tumid, slightly in advance of the centre; surface apparently marked with fine indistinct lines of growth. Length .24 inch; breadth about .13 inch; height .22 inch.

All our specimens of this species being more or less worn, it is possible the lines of growth may be more distinct on perfect specimens. Sometimes the posterior slope, from a little behind the beaks, appear to have been obliquely subtruncate.

Locality. Same as last.

CYCLAS SUBELLIPTICUS.

Shell small, elliptical-ovate, somewhat ventricose, thin and fragile; posterior end narrower than the anterior, both narrowly rounded; base semi-elliptical or semi-ovate; cardinal border apparently rounding gradually to both extremities; beaks not much elevated, pointed, incurved, not oblique, located near the middle; surface indistinctly marked with lines of growth. Length .24 inch; height .14 inch.

The beaks are so near the middle, and curved so nearly at right angles to the longitudinal diameter of the shell, that it is not easy to determine, especially from the examination of mutilated specimens, which is the posterior, or which the anterior end. As we have only seen imperfect specimens, we are not sure the surface markings are indistinct on unworn shells.

Locality. Three miles above Fort Union.

CYRENA MORZARUENSIS.

Shell ovate, nearly elliptical, compressed, extremities rounded; anterior end narrower than the posterior, base semi-ovate, most prominent behind the middle; beaks not much elevated, placed a little in advance of the centre; surface marked with fine distinct lines of growth; cardinal edge rather thick, and having under the beaks three diverging central teeth in each valve, the anterior of which is the smallest; lateral teeth two, (in the left valve) long, parallel to the cardinal edge, and fitting into corresponding grooves in the other valve; muscular impressions deep. Length about .90 inch; breadth .36 inch; height .66 inch.

Each of the cardinal teeth has, in its upper end, a small notch which is occupied, when the valves are closed, by a small projection between the teeth of the other valve. The anterior lateral tooth appears to be larger and approaches the central teeth more nearly than the posterior. Our specimens are generally more or less worn, and thickly coated with firmly adhering sand.

* The foregoing remarks are based upon the observations and collections of Dr. Hayden.

Locality. Near Moreau river, in a sand bed, associated with bones of *Titanotherium*? Probably a distant outlier of the White river bone beds.

CYRENA INTERMEDIA.

Shell oval-ovate, compressed, rather thin; extremities rounded; base semi-elliptical; beaks moderately elevated, not gibbous, placed nearly half way from the middle to the anterior end; surface marked with fine lines of growth, occasionally rising into obscure concentric wrinkles; edge of the cardinal border thin; cardinal teeth close under the beaks, posterior one very oblique. Length .76 inch; breadth .22 inch; height .68 inch.

This species approaches some varieties of *C. pinum*, of Deshay's (*Coq. foss.* page 117,) but is more inequilateral, the posterior end being comparatively longer, the beaks are also less elevated. From the last it will be distinguished by its shorter and more rounded form, more elevated beaks, and much thinner cardinal edge.

Locality and position. Same as last.

CYRENA OCCIDENTALIS.

Shell sub-triangular, very thick, rather ventricose; anterior end and base rounded, posterior end sloping abruptly from the beaks, and ventrically subtruncate at the extremity; beaks located a little in advance of the middle, and elevated, pointed, incurved, and approximate; surface marked with strong lines of growth. Length 1 inch; breadth .71 inch; height 1 inch.

Appears to be intermediate between *C. cordata* of Morris (*Proceed. Geol. Society*, vol. 10, pl. 2, figs. 7, 8, 9,) and *C. antiqua* of Ferussac, (see Deshay's *Coq. foss.*, pl. 18, figs. 19, 20, 21) both of which are Eocene species. From the first, it differs in being relatively higher; its posterior end is also shorter, and more distinctly subtruncate. From the latter, it differs in being less elevated, not so concave in front of the beaks, nor so regularly arcuate on the posterior slope from the beaks to the base. In front, it presents the same symmetrical cordate outline common to both these species.

Locality. Bad Lands of the Judith.

CONVULA SUBTRIGONALIS.

Left valve subtrigonal, very convex, obliquely truncate from the beaks to the extremities, the two slopes diverging at an angle of 95°; basal margin rounding up abruptly in front, and converging towards the posterior slope at an angle of about 48°; beaks elevated, located in advance of the middle; surface marked by faint lines of growth, and having below the middle three or four concentric wrinkles, which become stronger towards the extremities. The right valve is much more compressed, and without concentric folds. Length .74 inch; breadth .25 inch; height .55 inch.

The larger, or left valve of this species, has an obscure ridge passing from the beaks obliquely backwards and downwards to the posterior extremity, along which the valve is abruptly deflected towards the hinge margin. This and the following species may have possessed other surface markings not now preserved, the specimens being all considerably worn, as if they had been exposed to the action of waves on a beach.

Locality. Mouth of the Judith, associated with *Ostrea subtrigonalis* (Evans and Shumard), also *Melania*, *Paludina*, and other fresh water shells.

CONVULA PERUNDATA.

Right valve sub-trigonal, rather compressed, obliquely sub-truncate from the beaks toward both extremities, the slopes diverging at an angle of about 82°; basal margin rounding up in front, straight towards the posterior; beaks small, much elevated, and placed a little in advance of the middle; surface ornamented by five or six strong, elevated, concentric folds, otherwise apparently smooth. Length .32 inch; breadth .13 inch; height .27 inch.

The left valve of this species is yet unknown to us.

Locality and position. Same as last.

CORBULA MACTRIFORMIS.

Shell subtriangular, scarcely ventricose; right valve a little larger, thicker and more gibbous than the left; extremities narrowly rounded; posterior end longer than the anterior, slightly truncate at the extremity, and having an obtuse ridge passing from the beaks obliquely backwards to the lower posterior edge; base semi-ovate, most prominent in advance of the middle; beaks considerably elevated, pointed, incurved, and directed forward; surface marked with fine lines of growth. Length .64 inch; breadth about .33 inch; height .50 inch.

The tooth of the right valve is thick, and located immediately under the beaks, while that of the left is flattened, and placed a little behind them. The lateral edges of the cardinal border of the left valve, as well as its basal margin, which are sharp and prominent, fit into a distinct groove in the edge of the opposite valve. The muscular impressions are indistinct, and the sinus of the pallial impression triangular, very broad and shallow.

Locality. Fort Clark, where it is associated with *Melania*, *Paludina*, &c.

UNIO PRISCUS.

Shell ovate, rather compressed, very thin and fragile; anterior extremity short, rounded; posterior end narrower, contracting with a regular curve from above, and having at the extremity below a very obtusely rounded angle; cardinal border broadly arcuate; basal margin nearly straight behind the middle, rounding up in front; beaks very small, rising little above the hinge, located about one-sixth the entire length of the shell behind the front, and ornamented with small regular concentric wrinkles; surface of other portions of the shell smooth, or only marked with fine lines of growth. Length 2.78 inches; breadth unknown; height 1.63 inches.

Has much the aspect externally of an *Anodonta*, but a fragment in our collection shows enough of the hinge to prove it to be a *Unio*, without exhibiting the details of the teeth. Judging from the beaks, young specimens not more than half an inch in length must be beautifully ornamented with regular concentric wrinkles. It is usually found in a crushed condition between the laminae of clay.

Locality. Yellowstone River, forty miles above the mouth.

BULIMUS? TERES.

Shell small, sinistral, much elongated, terete; volutions ten to ten and a half, narrow, closely wound, and increasing very gradually from the apex, slightly convex near the summit of the spire, but flattened lower down; suture very faintly impressed between the lower volutions, but becoming more distinct towards the apex; surface marked with fine, regular lines of growth, passing straight across the whorls at right angles to the suture; aperture ovate, acutely angular above, rounded below; lip thin. Length .76 inch; breadth .19 inch; apical angle slightly convex, divergence 18°.

A few dextral shells were found associated with the above, which, as far as we have been able to see, differ from them in no other respect. It is possible, however, they may belong to a distinct species, though we are now inclined to regard them as merely a variety of the same. This and the following species are evidently closely related to a shell described by M. Matheron, from the Tertiary lignites near the mouth of the Rhone, south-east of France. (See *Melania acicula*, p. 219, pl. 36, fig. 25; *Catalogue Matheron*, &c.) Like some of ours, his is a sinistral shell, and has much the same general appearance, but it is even more elongated, and has nearly twice as many volutions. We doubt very much the propriety of referring such forms to the genus *Melania*, as they appear to us to have much more the aspect of land shells. Unfortunately all our specimens have the aperture more or less broken or distorted, as was the case with those studied by M. Matheron. The spire looks very like *Clausilia*, but the aperture was evidently more like *Bulimus* or *Achatina*. It is not improbable they may

of fold at its junction with the outer lip below. Length about 1 inch; breadth .37 inch; length of aperture .55 inch, breadth of do. .26 inch.

It is probable the above description will have to be modified somewhat, when perfect specimens are obtained, as all those we have seen are more or less broken.

Locality. Three miles below Fort Union.

PHYSA SUBELONGATA.

Shell elongate ovate; spire elevated, acute at the apex; volutions about six and a half, nearly flat; suture oblique, linear, scarcely distinct; surface faintly marked with lines of growth; aperture unknown; columella twisted into a kind of fold below the impressed umbilical region. Length 1.16 inches; breadth .53 inch; length of aperture about .57 inch; apical angle very convex, divergence 49°.

This *Physa* belongs to the same type as two or three elongated species described by Matheron, from the Great Lignite formations of the south of France, (*Catalogue Methodique*, &c., pl. 36.) It differs, however, from his *P. Gardanensis*, which it most nearly resembles, in having much flatter volutions, a less distinctly impressed suture, and relatively smaller body whorl. Our specimen is so much broken and worn, that if there were other markings than those preserved they would have been obliterated.

Locality. Bad Lands of the Judith.

PLANORBIS SUBUMBILICATUS.

Shell very small, subdiscoidal; spire flat; volutions two and a half to three, nearly cylindrical; surface marked with very fine, rather indistinct lines of growth; sutures strongly defined; umbilicus large, showing the volutions to the apex; aperture round or obliquely a little oval. Larger diameter .13 inch; smaller do. .14 inch.

Locality. Three miles below Fort Union.

PLANORBIS CONVOLUTUS.

Shell large, discoidal, nearly equally concave, and exhibiting all the whorls on both sides; volutions slightly embracing, very strongly separated by the sutures, more broadly rounded on the right than on the left side; surface (of cast) having faint undulations parallel to the obsolete lines of growth, which pass round very obliquely forward from the right to the left; aperture ovate, narrower on the left than the right side, slightly concave within, for the reception of the succeeding whorl; right lip projecting considerably beyond the left. Greater diameter 1.01 inch; smaller do. .32 inch.

In its general appearance this species approaches *P. rotundatus* of Brong., but is much less compressed. It differs also in the form of the aperture, which is wider than high, while that of *P. rotundatus* is higher than wide (See Deshayes' *Cog. foss.* pl. 9, fig. 7 and 8.)

Locality. Little Horn river.

VELLETIA (ANCYLUS) MINUTA.

Shell minute, ovate or elliptical-patiform, exceedingly thin and fragile; extremities rounded; anterior end apparently a little wider than the posterior; apex moderately elevated, obtuse, nearer the posterior end than the middle, turned to the left; front slope convex; posterior and postero-sinistral slopes concave, dextral convex; surface marked with fine concentric striae. Length .08 inch; breadth .06 inch; height .03 inch.

Resembles *Velletia elegans* of Edwards, (*Ancylus elegans* of Sowerby, Min. Conch. pl. 633) but is much smaller, and wants the radiating striae of that species.

Locality. Three miles below Fort Union.

PALUDINA MULTILINEATA.

Shell conical-ovate, rather thin; spire elevated; volutions six to six and a half, rounded convex, increasing gradually from the apex; suture strongly im-

pressed; surface ornamented by more or less distinct lines of growth, which are crossed by numerous small, thread-like, revolving lines; aperture comparatively small, obliquely-ovate; inner lip thin and reflexed below so as to partly cover the small umbilical perforation. Length 1 inch; breadth .71 inch; length of aperture .47 inch; apical angle convex, divergence 54 to 60°.

Sometimes the lower volution, which generally forms less than half the entire length of the shell, is slightly flattened above the middle, so as to leave an obscure angle a little below the suture. On the upper half of the volutions the revolving lines are separated by spaces from two to five times their width, but decrease in size and become closely crowded on the lower part of the last whorl, excepting near the umbilicus, where they are again stronger, more distant, and minutely flexuous. On worn specimens the revolving lines are often obscure.

Locality. Fort Clark.

PALUDINA VETULA.

Shell conical-ovate, not very thick; spire relatively small, moderately elevated; volutions about five and a half, convex, narrow, increasing gradually from the apex, last one large and ventricose; surface marked with fine lines of growth, which are crossed by obscure revolving lines; suture strongly impressed, very slightly oblique; aperture narrow ovate; umbilical perforation closed or very small. Length about .81 inch; breadth .60 inch; length of aperture .40 inch; breadth of do. .24 inch; apical angle nearly regular, divergence 60°.

Associated with this species a few specimens about one third larger were found, which have a more elevated spire, in consequence of which the divergence of the apical angle is some four or five degrees less. The revolving lines also appear stronger. It is very difficult to determine, without a larger number of individuals in a better state of preservation, whether they are a variety of this species or whether they may not be identical with the last. It is even possible a more extensive collection may prove both these to be only varieties of the last, though as we now see them, they present quite a different aspect, especially the smaller variety, which has a more slender and much less elevated spire, with more depressed whorls, smaller umbilical perforation, and much less distinct revolving lines. The body whorl is also relatively larger and much more extended below.

Locality. Bad Lands of the Judith.

PALUDINA LEAI.

Shell conical-ovate, oblique; spire not much elevated, pointed at the apex; volutions five and a half to six, convex, sometimes ventricose, last one obscurely angular below the middle; suture well defined; surface marked with fine lines of growth, which are crossed by extremely fine, nearly obsolete revolving striae, and at regular intervals by revolving rows of minute, shallow punctae; aperture broad ovate, obtusely angular above, rounded below; outer lip thin; inner lip thin above, thicker and slightly reflexed below the small umbilical pit; columella deeply arcuate. Length .97 inch; breadth .75 inch; length of aperture .47 inch; breadth of do. .40 inch; apical angle convex, divergence 65° to 80°.

This shell varies so greatly in the elevation of its spire, and the divergence of its apical angle, that its varieties might be mistaken for three or four distinct species. We have satisfied ourselves, however, by examining a large number of specimens, that all these varieties are connected by a regular series of intermediate forms. In some individuals the upper volutions are slightly flattened on top immediately below the suture, in others they are rounded convex, while in a few instances all the whorls are more or less depressed, so as to give the shell a subtrichiform aspect. Generally the fine revolving striae and rows of minute punctae are nearly obsolete, and they are never visible without the aid of a good lens.

It is an interesting fact that this species is so nearly allied, both in form and surface markings, to a *Paludina* now inhabiting the streams of Southern Asia, (*P. Bengalensis*, of Lea) as to give rise to a doubt whether or not they really are

of fold at its junction with the outer lip below. Length about 1 inch; breadth .57 inch; length of aperture .55 inch, breadth of do. .26 inch.

It is probable the above description will have to be modified somewhat, when perfect specimens are obtained, as all those we have seen are more or less broken.

Locality. Three miles below Fort Union.

PHYSA SUBELONGATA.

Shell elongate ovate; spire elevated, acute at the apex; volutions about six and a half, nearly flat; suture oblique, linear, scarcely distinct; surface faintly marked with lines of growth; aperture unknown; columella twisted into a kind of fold below the impressed umbilical region. Length 1.16 inches; breadth .53 inch; length of aperture about .57 inch; apical angle very convex, divergence 49°.

This *Physa* belongs to the same type as two or three elongated species described by Matheron, from the Great Lignite formations of the south of France, (*Catalogue Methodique*, &c., pl. 36.) It differs, however, from his *P. Gardanensis*, which it most nearly resembles, in having much flatter volutions, a less distinctly impressed suture, and relatively smaller body whorl. Our specimen is so much broken and worn, that if there were other markings than those preserved they would have been obliterated.

Locality. Bad Lands of the Judith.

PLANORBIS SUBUMBILICATUS.

Shell very small, subdiscoidal; spire flat; volutions two and a half to three, nearly cylindrical; surface marked with very fine, rather indistinct lines of growth; sutures strongly defined; umbilicus large, showing the volutions to the apex; aperture round or obliquely a little oval. Larger diameter .13 inch; smaller do. .14 inch.

Locality. Three miles below Fort Union.

PLANORBIS CONVOLUTUS.

Shell large, discoidal, nearly equally concave, and exhibiting all the whorls on both sides; volutions slightly embracing, very strongly separated by the sutures, more broadly rounded on the right than on the left side; surface (of cast) having faint undulations parallel to the obsolete lines of growth, which pass round very obliquely forward from the right to the left; aperture ovate, narrower on the left than the right side, slightly concave within, for the reception of the succeeding whorl; right lip projecting considerably beyond the left. Greater diameter 1.01 inch; smaller do. .32 inch.

In its general appearance this species approaches *P. rotundatus* of Brong., but is much less compressed. It differs also in the form of the aperture, which is wider than high, while that of *P. rotundatus* is higher than wide (See Deshayes' *Coq. foss.* pl. 9, fig. 7 and 8.)

Locality. Little Horn river.

VELLETIA (ANCYLUS) MINUTA.

Shell minute, ovate or elliptical-pattiform, exceedingly thin and fragile; extremities rounded; anterior end apparently a little wider than the posterior; apex moderately elevated, obtuse, nearer the posterior end than the middle, turned to the left; front slope convex; posterior and postero-sinistral slopes concave, dextral convex; surface marked with fine concentric striae. Length .08 inch; breadth .06 inch; height .03 inch.

Resembles *Velletia elegans* of Edwards, (*Ancylus elegans* of Sowerby, *Min. Conch.* pl. 533) but is much smaller, and wants the radiating striae of that species.

Locality. Three miles below Fort Union.

PALUDINA MULTILINEATA.

Shell conical-ovate, rather thin; spire elevated; volutions six to six and a half, rounded convex, increasing gradually from the apex; suture strongly im-

pressed; surface ornamented by more or less distinct lines of growth, which are crossed by numerous small, thread-like, revolving lines; aperture comparatively small, obliquely-ovate; inner lip thin and reflexed below so as to partly cover the small umbilical perforation. Length 1 inch; breadth .71 inch; length of aperture .47 inch; apical angle convex, divergence 54 to 60°.

Sometimes the lower volution, which generally forms less than half the entire length of the shell, is slightly flattened above the middle, so as to leave an obscure angle a little below the suture. On the upper half of the volutions the revolving lines are separated by spaces from two to five times their width, but decrease in size and become closely crowded on the lower part of the last whorl, excepting near the umbilicus, where they are again stronger, more distant, and minutely flexuous. On worn specimens the revolving lines are often obscure.

Locality. Fort Clark.

PALUDINA VETULA.

Shell conical-ovate, not very thick; spire relatively small, moderately elevated; volutions about five and a half, convex, narrow, increasing gradually from the apex, last one large and ventricose; surface marked with fine lines of growth, which are crossed by obscure revolving lines; suture strongly impressed, very slightly oblique; aperture narrow ovate; umbilical perforation closed or very small. Length about .81 inch; breadth .60 inch; length of aperture .40 inch; breadth of do. .24 inch; apical angle nearly regular, divergence 60°.

Associated with this species a few specimens about one third larger were found, which have a more elevated spire, in consequence of which the divergence of the apical angle is some four or five degrees less. The revolving lines also appear stronger. It is very difficult to determine, without a larger number of individuals in a better state of preservation, whether they are a variety of this species or whether they may not be identical with the last. It is even possible a more extensive collection may prove both these to be only varieties of the last, though as we now see them, they present quite a different aspect, especially the smaller variety, which has a more slender and much less elevated spire, with more depressed whorls, smaller umbilical perforation, and much less distinct revolving lines. The body whorl is also relatively larger and much more extended below.

Locality. Bad Lands of the Judith.

PALUDINA LEAI.

Shell conical-ovate, oblique; spire not much elevated, pointed at the apex; volutions five and a half to six, convex, sometimes ventricose, last one obscurely angular below the middle; suture well defined; surface marked with fine lines of growth, which are crossed by extremely fine, nearly obsolete revolving striae, and at regular intervals by revolving rows of minute, shallow punctae; aperture broad ovate, obtusely angular above, rounded below; outer lip thin; inner lip thin above, thicker and slightly reflexed below the small umbilical pit; columella deeply arcuate. Length .97 inch; breadth .75 inch; length of aperture .47 inch; breadth of do. .40 inch; apical angle convex, divergence 65° to 80°.

This shell varies so greatly in the elevation of its spire, and the divergence of its apical angle, that its varieties might be mistaken for three or four distinct species. We have satisfied ourselves, however, by examining a large number of specimens, that all these varieties are connected by a regular series of intermediate forms. In some individuals the upper volutions are slightly flattened on top immediately below the suture, in others they are rounded convex, while in a few instances all the whorls are more or less depressed, so as to give the shell a subtrochiform aspect. Generally the fine revolving striae and rows of minute punctae are nearly obsolete, and they are never visible without the aid of a good lens.

It is an interesting fact that this species is so nearly allied, both in form and surface markings, to a *Paludina* now inhabiting the streams of Southern Asia, (*P. Bengalensis*, of Lea) as to give rise to a doubt whether or not they really are

distinct. By comparison, however, with authentic specimens of the latter in the cabinet of Dr. Lea, at Philadelphia, we find his species is generally larger and slightly more elongated than ours, and the body volution more rounded and less extended below.

We name this species after Dr. Isaac Lea, the well known conchologist, who first made known one of its nearest living representatives.

Locality. Fort Union.

PALUDINA RETUSA.

Shell obliquely obovate; spire depressed conical, obtuse at the apex; volutions four and a half to five, convex, last one large, obliquely depressed above, and obscurely angular below; suture well defined; surface marked with distinct oblique lines of growth, and faint traces of extremely fine revolving striae; aperture (broad ovate?) obtusely angular above, rounded below; pillar lip thin above, thicker and closely folded back upon the deeply arcuate columella below. Length .84 inch; breadth .64 inch; apical angle very convex, divergence about 90°.

It is barely possible this may be one of the extreme varieties of the last; it differs however from any of the forms we have considered referable to that species, in having a much less elevated and more obtuse spire. The lines of growth also pass round the volutions much more obliquely, and the body volution is relatively larger. None of our specimens have the aperture entire.

Locality. Three miles below Fort Union.

PALUDINA CONRADI.

Shell elongate-trochiform, thick; spire rather elevated, acute at the apex; volutions apparently about six, flat, last one more or less angular below the middle, and obliquely extended below; surface marked with fine lines of growth, crossed by delicate, nearly obsolete, revolving lines; suture linear; aperture sub-circular, or broad ovate, obtusely angular above, (broadly rounded below?); columella profoundly depressed in the umbilical region; umbilicus none. Length about 1 inch; breadth .70 inch; length of aperture .44 inch; apical angle slightly convex, divergence 54°.

In young specimens the angle on the lower part of the body whorl is quite distinct, and modifies the form of the aperture, but is more obscure in older shells. Like *P. Lea* (of this paper), this species also has its near living representatives amongst Asiatic species, of which *P. Francisci* (Turbo *Francisci* of Wood.) is an example. We name it in honor of Mr. T. A. Conrad, of Trenton New Jersey.

Locality. Bad Lands of the Judith.

PALUDINA PECULIARIS.

Shell trochiform, rather thin, oblique; spire conical, acute at apex; volutions (five and a half?) flattened convex, last one distinctly angular a little below the middle; surface marked with fine, rather indistinct lines of growth, crossed by nearly obsolete, exceedingly fine revolving striae; suture moderately defined; aperture round ovate, or sub-quadrate.

Our specimens of this species are imperfect at both extremities; some of them have a breadth of .53 inch, and indicate a length of about .70 inch. The apical angle of a specimen consisting of the lower two whorls is 47°; but as it was probably greater near the apex, the mean may have been as great as 50°. In form and general appearance it is very much like the last, and may possibly prove to be only a variety of that species; it is, however, a thinner shell, and the volutions are more convex.

Locality. Fort Clark.

PALUDINA TROCHIFORMIS.

Shell trochiform, thin; spire conical, pointed at the apex; volutions five and a half to six, nearly flat, and ornamented by two slightly elevated revolving ridges; last whorl strongly angular below the middle; surface marked with very fine lines of growth, and exceedingly slender, raised, revolving lines; suture linear, scarce-

ly distinct; aperture sub-quadrate, or rounded ovate, more angular above, broadly rounded below; lip thin, reflexed on the columellar side below, but leaving a small umbilical groove; columella strongly arcuate. Length .86 inch; breadth .73 inch; apical angle convex, divergence 72° to 77° .

This interesting shell is so unlike the usual forms of *Paludina*, that we would have referred it to that genus with much doubt, had it not been for the fact that we have from the same bed some intermediate gradations between it and the usual typical forms of the genus. One of these, *P. Leidyi* of this paper must be (judging from the upper volutions,) in its young state, almost exactly like this, both in form and surface markings, yet at maturity, its last volution loses almost entirely the angular outline characterizing this species at all stages of its growth. We have seen fragments of this species indicating a size at least three times as great as that of the specimen from which the above measurements were taken.

P. cingulata of Matheron (see *Catalogue Methodique*, &c., p. 223,) from the Lignite formations near the mouth of the Rhone, resembles this more than any fossil species with which we are acquainted, but differs in the surface markings. Amongst recent species it has two or three closely allied representatives, now inhabiting the rivers of China and Siam, of which *P. pyramidata* (Phillippi) is an example.

Locality. Ten miles below Fort Union.

PALUDINA LEIDYI.

Shell very large, conical-ovate, oblique, thin; spire elevated; upper volutions flattened, and ornamented by two indistinct revolving ridges; lower ones more rounded, last rather ventri-ose, and obscurely angular below; suture linear and scarcely distinct above, but well defined between the lower whorls; surface marked with distinct lines of growth, crossed by very fine, elevated revolving lines, generally obsolete on the lower volutions; aperture apparently ovate; inner lip spread upon the body whorl, but leaving partly uncovered a small, deep, oblique umbilical pit. Length about 1.86 inches; breadth 1.32 inches; apical angle convex, divergence 65° .

The most remarkable features about this fine *Paludina*, are its large size, and the peculiarity of having the lower volutions smoothly rounded, or more or less convex, while those nearest the apex are flattened and ornamented by two obscure revolving ridges. The angle on the lower part of the last whorl is very obscure near the aperture, but becomes more distinct higher up, and must be quite conspicuous on young shells. Unfortunately we have no specimens with the aperture entire. Our best specimen consists of four volutions, and judging from the appearance of the broken apex, it must have had about two more.

We name this species after Prof. Joseph Leidy, of the University of Pennsylvania.

Locality. Ten miles below Fort Union.

VALVATA PARVULA.

Shell very small, much depressed or subdiscoidal; spire rising little above the body whorl; volutions about three, nearly cylindrical, and having near the middle, on the upper and lower sides, a distinct linear carina; surface marked with strong regular lines of growth; sutures distinct; umbilicus wide and deep, showing all the volutions to the apex, aperture round or transversely oval. Height .05 inch; breadth .10 inch.

From *V. tricarinata* (Say,) some varieties of which this resembles more than any species known to us, it differs in having a wider umbilicus, less elevated spire, and much stronger lines of growth.

Locality.—Three miles below Fort Union.

MELANIA MINUTULA.

Shell minute, elongate conical; volutions seven to seven and a half, convex, increasing gradually from the apex and flattened obliquely outward from above, near two-thirds of the way down, whence they round abruptly in to the suture

below, so as to form an obscure angle below the middle; suture very distinct; surface faintly marked with fine lines of growth; aperture ovate or sub-rhomboidal, angular above, widest near the middle, very narrowly rounded and obscurely sinuate on the inner side below; columella somewhat less arcuate than the outer side of the aperture; lip thin and slightly reflexed at its junction with the lower part of the columella. Length .16 inch; breadth .05 inch; length of aperture .04 inch, breadth do. .03 inch; apical angle regular, divergence 20° to 23°.

This beautiful little *Melania* approaches very near in size as well as in form, *M. spina*, a Miocene species described by M. Grataloup (*Conch. Melan.* 10, t. 5, fig. 6 and 7,) but differs in having fewer and more convex volutions.

Locality. Three miles below Fort Union.

MELANIA ANTHONYI.

Shell very small, conical-ovate; spire not much elevated; volutions five to five and a half, slightly convex, increasing somewhat rapidly from the apex, last one rather large and obtusely angular below; surface marked with fine, indistinct lines of growth, crossed by extremely fine, nearly obsolete, revolving striae; suture well defined; aperture ovate, angular above, widest a little below the middle, narrowly rounded and very faintly sinuate on the inner side below; lip thin, slightly reflexed on the lower and inner side, but leaving open a small umbilical perforation; columella regularly arcuate. Length .18 inch; breadth .10 inch; length of aperture .06 inch; breadth of do. .04 inch; apical angle slightly convex, divergence 41°.

Without a very careful examination with a good lens, in a favorable light, the extremely fine revolving striae on this neat little shell would be overlooked. In form it is almost an exact miniature of *M. Nebrascensis* of this paper, but a careful comparison with the young of that species of its own size, shows it to be quite different. In addition to this, it occurs in great abundance at localities where no authentic specimens of that species were met with. We have no doubt of its being an adult shell. We name it after Mr. John G. Anthony, of Cincinnati, Ohio, to whom we are under obligations for suggestions in regard to it and two or three other species described in this paper.

Locality. Yellow stone river, thirty miles above the mouth.

MELANIA MULTISTRIATA.

Shell small, elongate-ovate; spire conical, somewhat elevated, acute at the apex; volutions five and a half to six, convex; surface marked with fine indistinct lines of growth, and exceedingly fine, closely arranged revolving striae; suture well defined; aperture narrow-oval, or ovate, contracted, but scarcely sinuous below; columella regularly curved. Length .23 inch; breadth .12 inch; length of aperture .10 inch; breadth of do. .06 inch; apical angle regular, divergence 39°.

This may be distinguished from the last by its more elevated spire, and more elongated body whorl, which is never angular below. The aperture is also narrower, and the columella imperforate. From the young of *M. Nebrascensis* of its own size, it differs in being more elongated, and in having one or two more whorls. The revolving striae are also more uniform, and so very fine as to be only visible by the aid of a strong magnifier.

Locality. Ten miles above Fort Union.

MELANIA NEBRASCENSIS.

Shell elongate-ovate; spire conical, not very much elevated, acute at the apex; volutions about six, flattened convex; surface marked by fine lines of growth, crossed by numerous more or less elevated revolving lines, some of which, on the middle of the whorls, are sometimes so much larger than the others as to form distinct carinae; suture strongly impressed; aperture ovate, angular above, narrowly rounded and very faintly sinuous below; outer lip prominent below the middle; columella regularly curved. Length .78 inch; breadth .42 inch; length

of aperture .37 inch; breadth of do. .21 inch; apical angle convex or nearly regular, divergence (variable) 44° .

This species presents numerous varieties of form, apparently dependent upon age. In younger individuals the spire is relatively less elevated, the whorls more rounded and the aperture larger and more oblique. In its surface markings it also varies greatly, even in specimens of the same size. The carinae formed by the larger revolving lines being in some specimens quite distinct, while in others they are scarcely larger than the finer revolving lines which may be seen by the aid of a lens to form, with the lines of growth, a delicate sub-cancellate surface on all parts of the shell. On other specimens, all these surface markings are almost entirely wanting.

Locality. Ten miles above Fort Union.

MELANIA CONVEXA.

Shell rather large, much elongated, sub-cylindrical or terete; volutions (about ten?) flat, closely wound, and increasing very gradually from the apex; surface ornamented by fine lines of growth, crossed by distinct, regular, thread-like, revolving lines, and extremely fine, nearly obsolete revolving striae; suture generally indistinct; aperture apparently ovate; lip thin, having a broad very shallow sinus below the suture, and another near the base of the columella. Length about 1.60 inches; breadth .48 inch; length of aperture .45 inch; apical angle convex, divergence 21° .

Our best specimen of this interesting species consists of seven volutions, and appears to have lost two or three others from the apex; the aperture is also distorted. The larger revolving lines, about seven of which may be counted on the second volution, are quite distinct, and near one-third as wide as the spaces between, while the finer revolving striae are closely crowded, and so small as to be only seen by the aid of a good lens. The divergence of the apical angle, below the middle of an adult shell, is not more than 13° , while above, (and in young shells,) it is as much as 28° to 30° .

In the last number of the Proceedings of the Academy, we described a shell resembling this very closely in form, from the Yellow Stone river, where it was found associated, in a loose mass, with fragments of an *Ostrea* and a small Cretaceous species of *Cardium*, (*C. rerum*, Evans and Shumard). Our specimens being worn and imperfect, we supposed, from its associates, it must be a marine shell, and referred it to the genus *Turritella*, under the name of *T. convexa*. We now think it may possibly be a specimen of this species, from the junction of the Cretaceous and Tertiary beds.

Locality. Bad Lands of the Judith.

CERITHIUM NEBRASCENSIS.

Shell elongate-conical, very slender, whorls (nine?) convex, and ornamented by three revolving rows of sharply elevated granules, placed upon obscure vertical folds; surface marked with very fine lines of growth, crossed by much stronger, elevated, thread-like, revolving lines, two, three, or more of which may be counted between each row of granules; suture distinct; aperture apparently nearly circular, but terminating below on the inner side, in a small notch. Length about 1 inch; breadth .29 inch; apical angle regular, divergence 19° .

On the lower part of the body whorl there are three or four small revolving lines, two of the upper of which are sometimes granular, making on this whorl five rows of granules. Between these and the next row above, one of the revolving lines is also minutely granular. In form and general appearance, this resembles two or three species described by Deshayes, from the Paris basin, but on close comparison, we find it quite distinct from them all. Amongst existing species, it appears to be nearest *C. granulosum*, and estuary species from the Western coast of Africa.

Locality. Near head waters of Little Missouri.

We are under obligations to Prof. James Hall, of Albany, New York, for the free use of his extensive collection of books on Palaeontology, as well as for occasional suggestions while investigating the Nebraska fossils, described in this and our former papers.

Correction.

In a paper communicated by us to the Acad my in March last, and published in the preceding number of the Proceedings, we referred to the genus *Fyrula* a shell (*P. Bairdi*, page 66), which we have since satisfied ourselves belongs more correctly to the genus *Busycon* of Bolten; we now change the name to *Busycon Bairdi*.

Ceratites Americanus.

By PROFESSOR L. HARPER, University of Mississippi.

The *Ceratites*, a *Cephalopodus* mollusk, subgenus of *Ammonites*, has been discovered in Europe long ago. All the European species, without any exception, belong to the new red sandstone or Triassic formation. Twenty-one species have, according to Bronn, been placed in the St. Cassian formation in Tyrol, to which the lowest place in the Trias has most probably to be assigned. One species is found in the St. Cassian rocks and also in the Muschelkalk; one in the Bunter sandstein and the Muschelkalk, and of the remaining eight species, three belong certainly and five probably to the Muschelkalk of the Trias. The *Ceratites* were therefore considered as characteristic, and belonging exclusively to the new red sandstone formation, and exclusively a European fossil, until a few years ago L. V. Buch, the late great German Geologist, discovered a *Ceratites* in the cretaceous rocks of the Caucasus, which he called *Ceratites Syriacus*. No species of the *Ceratites* has heretofore been found on the continent of America.

About three years ago, in summer, 1853, when I was in the State of Alabama, I examined the bed of the Tuscaloosa or Black Warrior River, near the little village of Erie in Greene County, about 12 miles above the confluence of the Tombigbee and Black Warrior rivers, between the 32d and 33d degrees of north latitude, where the river cuts through the lowest part of the cretaceous formation of our southern State, corresponding most probably to the Turonian of D'Orbigny. The bluff of the river consists here entirely of different strata of green sand, divided in several parts by thin seams of a hard conglomerate of peroxide of iron and green sand, and is from 50 to 95 feet high. The river was then unusually low, and more than one-half of its bed perfectly dry and accessible.

On a sand-bank in the middle of the river, immediately below a very deep place, were found, among other evidently cretaceous fossils, three specimens of a small *Ammonite*, which, after a careful examination, I immediately recognized to be a species of *Ceratites*, in which opinion I was later confirmed by as high an authority as Prof. L. Agassiz, of Cambridge, who pronounced it to be a new species of *Ceratites*, closely allied to *Ceratites Syriacus* of L. V. Buch.

This being the first *Ceratites* ever found on the continent of America, I propose for it the name of

CERATITES AMERICANUS.

Testa compressa, disco haud dissimili, paulisper densata ad aperturam, valdeque attenuata ad apicem, et praeipue subito accrescente a medio usque ad aperturam; sufractibus duabus, secundo amplexo primi ventre et tanquam in striam posito; apertura semi-ovata; loborum numero, in vita, sex, totidemque sellae, lobo ventrali atamen nonnihil indistincto; lobis dentibus tribus munitis, qui magnitudinis causa etiam lobi secundarii vocarentur; septis angularibus dorso retrorsum flexis; siphunculo dorsali.

The two specimens, still in my possession and here represented, are both very

much water-worn. They are both flat and discoid, No. 2 more so than No. 1; both taper very much towards the apex, and increase especially rapidly from the middle towards the aperture. Both consist of at most two whorls, the dorsal part of the second being more than half overlapped by the ventral part of the first, and lying, as it were, in a groove. They have apparently six lobes and as many saddles, the lobes being provided with three teeth, which, on account of their size, might rather be called secondary lobes. The septa are angular and bent backwards on the back. The siphuncle is dorsal, as seen on fig. A, where it is broken out and has left a groove. In No. 1 the latter half of the second whorl is broken out and a hole is left. The size of both specimens is very nearly the same. No. 1 measures in length 58·3 millimetres, in width 50·2, and in thickness 31. No. 2 measures in length 51·2 millimetres, in width 46, and in thickness 26.

No. 2.



No. 1.



I was first inclined to recognize in the three specimens two different species, but the somewhat different appearance seems to have been caused by the attrition which they have undergone.

The question arises here, from which formation these *Ceratites* come? The circumstances that they have been found in the lower cretaceous formation, that carbonate of lime is the fossilizer, and that they are closely allied to *Ceratites Syriacus* of the cretaceous formation of Asia Minor, are indeed strong reasons to pronounce them to be cretaceous fossils, but this seems to me still somewhat doubtful.

When I first saw them, I was not aware that *Ceratites* had ever been found in any other but in the Triassic formation, and the discovery astonished me in a high degree. I was indeed induced to believe that they indicated the presence of the Trias somewhere not very far from the place where they were found, until I saw that L. V. Buch found *Ceratites* in the cretaceous rocks.

It is true the specimens alluded to were found on a sand-bank in the Black Warrior River, where it cuts through the lowest part of the cretaceous formation of our southern States, just below a very deep place of the river; but are they not marked out of a formation underlying the upper secondary and reached by the water of the river in that deep place? If these *Ceratites* were a fossil belonging to the cretaceous formation, even to the very lowest part of it, specimens of them must and would have been found before and after my finding them. There are a great many places in Alabama, as well as in Mississippi and Tennessee, where the lower part of the cretaceous rocks crops out, where it is cut through by rivers and gullies, and where it has often and carefully been examined and searched for fossils, but never, neither before nor afterwards, have specimens of *Ceratites* been found.

I have myself carefully examined a good many such outcrops in Alabama, even the one where the *Ceratites* were found; as State Geologist of Mississippi, and for more than two years engaged in the geological survey of this State, I have examined very nearly all the outcrops of the lower cretaceous formation, which is here still better developed than in Alabama; I have made it a particular point to search carefully for *Ceratites*, but never again have I succeeded to find another specimen of the *Ceratites*; nor have I ever heard that any one of the many amateurs that collect fossils has ever seen or found one.

That the above described specimens of *Ceratites* have been washed out of a formation underlying the cretaceous rocks in Alabama, seems to me the more probable, first, as there is in that State between the carboniferous and cretaceous formation an area occupied by an intermediate, undetermined formation, extending from Autauga County through parts of Bibb, Tuscaloosa and Pickens to Fayette County, which has been laid down in the geological chart of that State of 1849 (by a typographical error, as I understand,) as *tertiary*, but which, although in many places covered by drifted tertiary sands and clay, is by no means tertiary. It goes under the lower cretaceous rocks and is overlapped by them, is clearly visible, not only in the northern part of the town of Eutaw, but also at Finch's Ferry, on the Black Warrior, in Greene County. What formation this is seems difficult to decide, it being devoid of fossils. It must, of course, be one of the older formations, intermediate between the coal and the lime, and I should not at all be astonished if a careful examination should give the result of its classification among the Poikilitic rocks, to which its variegated clay bears indeed great resemblance. Another reason which renders it more probable that the *Ceratites* have been worked out of a formation underlying the cretaceous formation, is that nearly all the Artesian wells in Greene County, in Alabama, contain a great deal of chloride of sodium and give really salt water. It is not very probable that this chloride of sodium, very seldom, if ever, comes from the salt-bearing cretaceous formation.

Examination of the Meteoric Iron from Xiquipilco, Mexico.

By W. J. TAYLOR.

The meteoric iron from Xiquipilco, Mexico, appears to have been first mentioned in the *Gazeta de Mexico* in 1784. It is stated there that small pieces of native iron, from a few ounces to fifty pounds in weight, were very numerous, which were sought for by the Indians after heavy rains, who used them for manufacturing agricultural implements.

In a dissertation on metallic meteorites by Prof. W. S. Clark, the following notices of its literature are given: *Ann. des Mines* t. 2, ser. 1, p. 337. *Gazeta de Mexico* 1784—85, vol. 1., pp. 146, 200. Klaproth *Beiträge zur chemischen*

Kenntnis der Mineral Körper, B. 4, S. 101. Sonnenschmit, Beschreibung der vorzüglichsten Bergwerke. Reviere in Mexico 1804, S. 192 and 298. Chaldni, (U. F. M. S. 336.) Partsch, (D. M. S. 99.)

In the examination made by M. Berthelin he failed to detect the presence of cobalt, but it is mentioned by Prof. Clark that Manross had found it in a specimen from the cabinet of Prof. Wöhler; my examination confirms in this respect that of M. Manross.

To the kindness of W. S. Vaux, Esq., I am indebted for the material for this investigation; Mr. Vaux has in his magnificent cabinet the principal portion of a mass which weighed over ten pounds. It was originally about six inches long, with an average diameter of three inches; the lump was oblong with rounded ends, the whole being covered with a thin crust of limonite.

A cross section cut from this lump has been carefully polished and etched by strong nitric acid, which gives a most beautiful surface of about three and a half inches in length by two and a half in breadth, covered with the greatest complexity of widmanastellian figures which almost defy description.

The surface is crossed by bands about one-tenth to one-sixteenth of an inch in breadth; these apparent bands are cross sections of different planes, as is readily perceived by their different refractive powers.

On changing the position of the specimen, those that are a bright silvery-white in one direction, become a dull gray in another, and vice versa.

There are several systems of bands, which preserve a parallelism among themselves and cross other systems at various angles, forming trapezoids, rhombs and triangles. These several fields and their characteristic etchings will be described in detail at some future time. Along the bands or planes thin laminae of schreibersite have been observed, as in other meteoric irons.

Imbedded in one side of the large lump (just described) was a globule of pyrrhotine, which looks as if it had been dropped into the iron when it was in a semi-fluid state. This globule appears to have been about an inch in diameter; it was in part decomposed, but a small portion of the mineral was separated sufficiently pure for the determination of its specific gravity and analyses. On dissolving it in hydrochloric acid, thin laminae of schreibersite separated with minute portions of chromic iron.

Through the kindness of Dr. F. A. Genth, I have been permitted to make the following analyses in his laboratory:

Pyrrhotine dissolved in nitric acid, gave

Sulphur,	-	-	-	-	-	-	33.76	per cent.
Iron,	-	-	-	-	-	-	57.95	"
Nickel,	-	-	-	-	-	-	6.70	"
Cobalt,	-	-	-	-	-	-	.56	"
Silicon,	-	-	-	-	-	-	.05	"
Phosphorus,	-	-	-	-	-	-	.25	"

99.27

"

No. 2. Dissolved in hydrochloric acid, gave—

Iron,	-	-	-	-	-	-	58.25	per cent.
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A residue remained, which was dissolved after being treated with hydrochloric acid and chlorate of potash; it consisted of—

Copper,	-	-	-	-	-	-	0.12	per cent.
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The remainder consisted principally of chromic iron, with a small portion of schreibersite.

The specific gravity was found to be 4.822. The ratio of sulphur to the metals was found to be

Sulphur,	2.102	Iron,	2.066	} 2.301
		Nickel and Cobalt,	0.245	

It will be seen that the composition corresponds with that of pyrrhotine, considering its formula to be FeS , if we disregard the few impurities which were found with it.

The meteoric iron was first treated in a flask with hydrochloric acid, and the

gas evolved was passed through a solution of ammonia chloride of copper, but not a trace of sulphur could be detected in this manner.

In the 5th supplement to Rammelsberg's Handwörterbuch der Chemischen Mineralogie, this meteoric iron is mentioned as passive, experiments having been made by Prof. Wöhler; but the piece belonging to Mr. Vaux is evidently active, throwing down metallic copper from a neutral solution of its sulphate. This experiment was repeated with great care with confirmatory results.

No. 1 was dissolved in hydrochloric acid, and a slight precipitate was obtained by hydrosulphuric acid, which, on a careful examination before the blow-pipe, was found to be copper with a trace of tin.

Iron,	-	-	-	-	-	90.72 per cent.
Nickel,	-	-	-	-	-	8.49 "
Cobalt,	-	-	-	-	-	.44 "
Schreibersite, chromic iron, &c.,	-	-	-	-	-	.38 "
Silicon,	-	-	-	-	-	.25 "
Phosphorus,	-	-	-	-	-	.18 "

The phosphorus was estimated in a separate portion, which was first oxydized by nitric acid and fused in a platinum crucible with carbonate of soda.

No. 2 was dissolved in nitric acid. It gave—

Iron,	-	-	-	-	-	90.37 per cent.
Nickel,	-	-	-	-	-	7.79 "
Insoluble residue,	-	-	-	-	-	1.91 "

Description of two new species of Urodeles, from Georgia.

By EDWARD HALLOWELL, M.D.

Sub-Fam. BOLITOGLOSSIDÆ.

Pseudotriton marginatus, nob.

Char. Head small, depressed, rounded in front; eyes lateral, oblique, not prominent, looking upward and outward; gape of the mouth extending a short distance behind the posterior commissure of the eye; maxillary teeth small, internal nares small and circular; a transverse row of vomerine teeth on each side passing behind the internal nares, continuous with several rows of longitudinal palatine teeth diverging posteriorly, so as to leave a wide interspace in the shape of the letter V reversed; tongue small, circular, bolitoglossal, free at the edges, and supported upon a small central pedicel; body slender, cylindrical; extremities slender; toes 4—5; tail somewhat compressed, longer than body.

Color. Dark ash color above, almost black, shaded obscurely with yellow; a lateral band of dusky white margined with black on each side near the abdomen, extending from the anterior to the posterior extremities; under parts dusky white, very minutely spotted or blotched with black.

Dimensions. Length of head 3 lines; greatest breadth 2 lines; length of neck and body to vent 1 inch 4 lines, (Fr.) length of tail 1 inch 4 lines. Total length 2 inches 11 lines.

Habitat. Liberty County, Georgia. One specimen in Mus. Acad. Nat. Sc., presented by Major Le Conte.

Pseudotriton flavissimus, nob.

Char. Head of moderate size, rounded above; snout truncate; eyes rather prominent, latero-superior, oblique, looking upward and outward; tongue small, circular, mushroom-shaped, supported upon a central pedicel, the edges free; internal nares rather small, ovoid or subcircular in shape; maxillary teeth minute, sharp-pointed, the points directed backward; vomerine and palatine teeth as in *marginatus*; body more robust than in the former species, more or less compressed upon the sides; extremities slender; tail compressed, of nearly same length as body, (about a line longer.)

Color. Yellow above, inclining to brown, with very numerous small black spots; under parts of a brighter yellow throughout, without spots.

Dimensions. Length of head 4 lines; greatest breadth 3 lines; length of neck and body 1 inch $2\frac{1}{2}$ lines, (Fr.;) of tail 1 inch 5 lines; total length 3 inches 2 lines.

Habitat. With the preceding in Georgia. One specimen in Mus. Acad. Nat. Sc., presented by Major Le Conte, U. S. A.

Contributions to the Ichthyology of the Western Coast of the United States, from specimens in the museum of the Smithsonian Institution.

By CHARLES GIRARD, M. D.

Two years have scarcely elapsed since I communicated to the Academy descriptions of various fishes collected upon different points of the Pacific coast of North America. During that period the indefatigable researches of several officers of the U. S. Army, and naturalists attached to the surveys made under orders from the General Government, have brought to light many new and interesting members of that class of animals, and of which I propose now to give a brief account, extracted from final Reports, made to the officers in charge of these surveys.

It has also been deemed advisable to mention such changes as have been made in the generic position of several species previously described, either by me or others, in order to give a more correct idea of the Reports just alluded to.

It will be remembered that while I was engaged in those investigations of our Western fishes, two naturalists, Drs. W. O. Ayres and W. P. Gibbons, both residents of San Francisco, Cal., had (without any knowledge of what I was doing,) described a certain number of species, some of which we already know have proved identical with my own. The law of priority in their publication will decide upon the names to be finally adopted in the nomenclature. So far I have been unwilling to settle upon any identifications without the specimens to go by, in order to avoid confusion as well as complicate the synonymy. Drs. Ayres and Gibbons, both, have shown an earnest desire to furnish me with authentic specimens of the species which they have described, and I am happy to say that from the former I have been favored by a good many up to this day, as will be seen further on.

For reference to the species described by Prof. Agassiz, some of which have appeared in my papers, it is but just to say that such identifications as were attempted by me, were made from the accounts published at that time. As far as genera are concerned I feel confident that no error was committed; in regard to the species I entertain certain doubts which can not be removed by the documents at our command. I have sought to do justice to the subject from the very beginning, and rather than introduce any changes in their present nomenclature I send them before the world as they now stand.

With the above preliminaries I proceed into the subject.

The species formerly described by me under the genus *Labrax* were found, upon further examination, to constitute a genus by itself, the relationship of which being more those of *Serranus* than of *Labrax*, and it is in the vicinity of the former that it ought to be placed in the ichthyic method. From *Serranus* it may be distinguished by the outline of the spinous dorsal fin, and the relative development of the canine teeth, which are so small as to have suggested the idea that the species belonged to *Labrax*.

The new genus we will henceforth call

PARALABRAX,

and characterise as follow: "General physiognomy that of *Labrax*, but the first dorsal fin is contiguous to the second as in *Serranus*. The profile of the body is subfusiform the caudal fin subtruncated or slightly emarginated posteriorly.

The head is subconical, the lower jaw a little longer than the upper, the mouth rather large; card-like teeth upon the premaxillaries, dentaries, vomer and palatines, with a row of small canine teeth along the edges of the jaws. Tongue smooth. Small and homogenous spines upon the outer curve of the preopercle. Two small and inconspicuous spines upon the margin of the opercle. Edge of suborbital, entire; humerus denticulated; opercular apparatus and cheeks covered with scales, smaller on the cheeks than on the opercles. Gill openings continuous under the throat; branchiostegal rays, six in number. Scales minutely serrated posteriorly."

PARALABRAX NEBULIFER and P. CLATHEATUS

are the two species.

Dr. Ayres's *Centrarchus maculosus* is my *C. INTERRUPTUS*.

A new and interesting member of the group *Trachinidae*, we inscribe into the method under the appellation of

HOMALOPOMUS,

"The general aspect of which is elongated, the mouth large, the lower jaw longest; upper and lower jaws provided with canine teeth; card-like teeth on the vomer. Palatines toothless; tongue smooth. Dorsal fins separated; anterior, small and subtriangular; posterior, extending mostly to rest of space towards the caudal. Anal fin longer than deep, situated far back. Opercular apparatus spineless and scaly; cheeks smooth and scaleless. Upper surface of head covered with minute scales. Scales covering the body of moderate development with posterior margin entire, and smooth. Gill openings continuous under the head; branchiostegals, six in number."

A single species is known, several specimens of which were examined, all of which were collected at Astoria, Oregon Territory, by Lt. W. P. Trowbridge, U. S. A., to whom I take pleasure in dedicating it.

HOMALOPOMUS TROWBRIDGII

has the "snout pointed, the mouth deeply cleft, and the posterior extremity of the maxillaries extending to the vertical line of the posterior edge of the pupil. The eyes are large. The tips of the pectoral fins reach as far as the anterior margin of the anal fin. The color is greyish brown above, and silvery grey beneath."

In the Cottoid group there are glorious additions. In the first place I have had the great satisfaction of identifying, from actual specimens, the *Cottus asper* of Sir John Richardson, and to describe it comparatively with the other members of the same genus.

Amongst the truly marine representatives I will first introduce a type which seems to bear much closer affinities to the fresh water genera than was anticipated.

In naming it

OLIGOCOTTUS,

allusion is made chiefly to its diminutive size. We have full evidence that the specimens before us are adults, and consequently have not hesitated in the selection of that name. We are aware, however, that further search might bring to notice other species not quite so small and still of the same generic stamp. On the other hand, the etymology of a name is of but little avail towards elucidating the history of the object it designates. The natural characters of the genus will read as follows: "Head smooth, with the exception of a few spines upon the preopercle and snout. Upper jaw slightly the longest. Teeth upon the premaxillaries, dentaries, front of vomer and palatines. Gill openings continuous under the throat; branchiostegals six. Dorsal fins contiguous. Caudal posteriorly rounded. Insertion of ventrals backwards the base of pectorals. Origin of anal fin in advance of the anterior margin of second dorsal. Skin smooth, lateral line continuous for the whole length of the body."

OLIGOCOTTUS MACCLOSUS.

being the only species known at present, we will characterize it by saying: "that the mouth is moderately cleft; the posterior extremity of the maxillary extending to a vertical line intersecting the pupil. A stoutish bicuspid processus on the convexity of the preopercle. Two acute nasal spines. Anterior dorsal lower than the second or posterior. Yellowish brown above, mottled or variegated with blackish; along the dorsal region a series of blotches of a deeper hue; lower half of the sides vermiculated. Abdomen of a bright saffron or yellow hue in the male. Inferior surface of head with traces of black markings: throat and abdomen unicolor, as also the ventrals and anal. Dorsals, caudal, and pectorals transversally barred."

It has been observed on several points of the coast between the bay of San Francisco, Cal., to Puget Sound, W. T. In 1854, a few dried up specimens were taken near Presidio by Lt. W. P. Trowbridge, but their precarious state of keeping did not permit us to classify them. The same was the case with those collected at Fort Steilacoom by Dr. Geo. Suckley. It is but very recently that well preserved specimens, collected by E. Samuels, in Tomales Bay, Cal., having reached us, we have been prepared to determine their position in the ichthyic method.

The fish mentioned by Dr. Ayres under the name of *Acanthocottus inermis* proves to be my *LEPTOCOTTUS ARMATUS*.

Next in order is another and entirely new genus, for which the name of

LEIOCOTTUS,

has been selected, more particularly in reference to its smooth aspect. Its characters are: "head perfectly smooth: spines upon the preopercle only. Mouth moderately cleft; jaws equal. Teeth upon the premaxillaries, dentaries and front of the vomer; none on the palatines. Barbules upon the maxillaries. Gill openings continuous under the throat; branchiostegal rays five. Dorsals nearly contiguous upon their bases. Ventrals inserted backwards of the base of the pectorals. Caudal posteriorly subtruncated. Skin perfectly smooth, bearing neither prickles nor scales. Lateral line well marked and continuous from head to tail."

The species which has come under my observation has so much of the aspect of *Trigla* that the specific name of

LEIOCOTTUS HIRCHDO

suggested itself for it." The snout is declivous and rather pointed; the posterior extremity of the maxillary is provided with two or three barbules and reaches a vertical line drawn a little beyond the anterior rim of the orbit. Superior regions blackish brown; abdomen whitish beneath; inferior part of tail yellow."

It was collected by Lt. W. P. Trowbridge, U. S. A. at the island of San Miguel, Cal.

Dr. Ayres' *Hemitripterus marmoratus*, is my *SCORPÆNICHTHYS MARMORATUS*,

Clypeocottus robustus of the same author, is my *ASPICOTTUS BISON*.

The species described by me as *Scorpenichthys lateralis* was subsequently referred by Dr. Ayres to a new genus of his under the denomination of *Calycelepidotus lateralis*, together with another species at that time unknown to me, under the name of *C. spinosus*. On a former occasion Dr. Ayres had announced the presence of two species of hemilepidoti in the Bay of San Francisco, for which he proposed the names of *H. nebulosus* and *H. spinosus*. My *Scorpenichthys lateralis* was subsequently identified by himself to his *H. nebulosus*, and it was then that the genus *Calycelepidotus* appeared with two species: *C. spinosus* and *C. lateralis*.

C. spinosus I have carefully examined, and I am satisfied that its proper place is in the genus *Hemilepidotus*, as characterised by Cuvier. In order, however, to furnish reliable data to go upon, I must be permitted to offer a diagnosis of that genus as it now stands.

HEMILEPIDOTUS.

"Head rough and prickly, with membranous flaps on various parts; opercular apparatus spinous. Mouth moderately cleft; jaws equal. Teeth upon the premaxillaries, dentaries, front of vomer and palatines. Gill openings separated beneath by an isthmus; branchiostegals, six on either side. Dorsal fins contiguous. Caudal rounded posteriorly. Insertion of ventrals opposite the base of pectorals. Longitudinal bands of scales alternating with naked areas; scales themselves finely denticulated."

HEMILEPIDOTUS SPINOSUS

"has membranous flaps on the upper surface and sides of the head. The eyes are quite large. The posterior free extremity of the maxillary extends to a vertical line drawn at the posterior rim of the pupil. Dorsal band of scales composed of six rows or series; lateral band of seven, five below and two above the lateral line. Ground color dark reddish brown, with darker transverse bands and blotches."

Specimens labelled by Dr. Ayres were collected in the Bay of San Francisco, Cal., by Dr. John S. Newberry; others in Humboldt Bay, by Lt. W. P. Trowbridge, U. S. A.

So much for *Calycilepidotus spinosus*: it is a true Hemilepidotus.

As to *C. lateralis*, the second species of Dr. Ayres' genus, a careful study has convinced me that it is not specifically identical with my *Scorpaenichthys lateralis*. Subsequent investigations of more perfect specimens have convinced me of the propriety of removing the latter from the genus *Scorpaenichthys*, and since I had no specimens of *Hemilepidotus nebulosus*, Ayres, (*Calycilepidotus lateralis*, Ayres, non mihi) by which to determine its generic affinities, I have been compelled to institute, under the name of

ARTEDIUS,

a new genus to receive two species, the one above referred to, and formerly described by me as *Scorpaenichthys lateralis*, and another which so far had remained unnoticed. The following are its characters: "Head rough, with supra-orbital membranous flaps. Spines upon the preopercle only. Mouth moderately cleft; lower jaw slightly overlapped by the upper. Teeth upon the premaxillaries, dentaries, front of vomer, and palatines. Gill openings continuous under the throat; branchiostegals five on either side. Dorsal fins separated. Caudal sub-truncated posteriorly. Insertion of ventrals opposite the base of the pectorals. A dorsal band of pectinated scales."

ARTEDIUS LATERALIS.

Scorpaenichthys lateralis, Grd., has the "surface of the head smooth. Preopercle armed with a flat bicuspid spine. Band of dorsal scales narrow, originating at the thoracic arch and extending to near the terminus of the base of the second dorsal. Anterior margin of first dorsal situated in advance of the thoracic arch. Deep chesnut brown above, maculated with yellowish; beneath yellowish."

Specimens collected at San Luis Obispo, Cal., by Lt. W. P. Trowbridge, U. S. A.

ARTEDIUS NOTOSPILOTUS

is characterised by the "surface of the head being subtuberculous and scaly. Preopercle armed with a flat tricuspid spine. Anterior margin of first dorsal situated in advance of the beginning of the dorsal band of scales, which is broad and extends from the thoracic arch to near the terminus of the base of the second dorsal. Olivaceous, with a series of saddle-like black patches. Abdomen dull yellow or white."

Collected by E. Samuels in Tomales Bay, Cal.

Sebastes ruber, Ayres, is my *SEBASTES ROSACEUS*.

Sebastes nebulosus, Ayres, is my *SEBASTES FASCIATUS*.

Sebastes variabilis, Ayres (not Cuvier) is my *SEBASTES AURICULATUS*.

SEBASTES MELANOPS,

is a species hitherto undescribed, and which we thus characterise: "Upper surface of head generally spineless. Posterior extremity of maxillary reaching a vertical line drawn interiorly to the posterior rim of the orbit. Origin of dorsal fin opposite or else slightly in advance of the base of the pectorals. Upper regions blackish brown; sides brownish, spotted with black; beneath greyish brown."

Specimens were collected at Cape Flattery, W. T., and at Astoria, O. T., by Lt. W. P. Trowbridge, U. S. A.

A fine addition to the group of Heterolepids instituted in 1854 with two genera. *Chirus* and *Ophiodon*, is the new genus

OPLOPOMA,

characterised by an "elongated body, membranous flaps above the orbits, and spines on the preopercle. The snout is conical; the mouth large, and the lower jaw the longest. Canine teeth upon the premaxillaries, dentaries, front of vomer and the palatines. Gill openings continuous; branchiostegals six on either side. Dorsal fins contiguous. Caudal posteriorly subcrenate or else concave. Insertion of ventrals a little posterior to the pectorals. Body covered by small cycloid scales."

OPLOPOMA PANTHERINA,

the only species hitherto known, has the "upper surface and sides of the head granular. The preopercular spines are few, small and blunt. Posterior extremity of maxillary extending beyond the orbit. Origin of anterior dorsal situated in advance of the convexity of the preopercle. Scales extending over the base of both the caudal and pectoral fins. Blackish brown above, reddish brown beneath. Dorsal and lateral regions spotted with black."

Specimens of this species were collected by Lt. W. P. Trowbridge, at Cape Flattery, W. T.

GASTEROSTEUS SERRATUS, Ayres, I have investigated carefully, and found specifically distinct from its congeners.

I describe another species akin to it and *G. plebeius*.

GASTEROSTEUS INTERMEDIUS

having the "body plated all over; the peduncle of the tail keeled. Dorsal spines three, moderate in development and inconspicuously serrated upon their edges; anterior one inserted immediately behind the base of the pectorals. Insertion of ventrals under the second dorsal spine; their own spine being serrated upon both edges, more conspicuously above than below, and their extremities not extending as far as the tips of the *ossa innominata*. Posterior margin of caudal concave."

Inhabits Cape Flattery, W. T., where it was collected by Lt. W. P. Trowbridge, U. S. A.

Finally, under the name of

GASTEROSTEUS PUGETTI,

I introduce a new species in which the "body is only plated in part. Dorsal spines three, slender, not serrated upon their edges; anterior inserted immediately behind the base of pectorals. Insertion of ventrals in advance of the second dorsal spine; their own spine being slender, crenated upon its edges and extending beyond the tips of the *ossa innominata*. Posterior margin of caudal slightly emarginated."

Fort Steilacoom, Puget Sound, W. T.; collected by Dr. Geo. Suckley, U. S. A.

LEUCOSTOMUS LINEATUS, Ayres, has come within my observation. The species is characteristic. Specimens of it were brought home by Dr. J. S. Newberry.

LEUCOGYRINUS GRACILIS, Ayres, I have likewise examined on specimens collected by Dr. Newberry and labelled by Dr. Ayres.

GObIUS NEWBERRYI

is a small and very graceful species of Goby, hitherto undescribed. The average size of many specimens observed is about two inches or less, the head forming the fourth of the total length. The first dorsal is contiguous to the second at its base, and is considerably lower than the latter. The mouth is deeply cleft, the posterior extremity of the maxillary extending to a vertical line passing posteriorly to the orbit. The origin of the anal is situated a little behind the anterior margin of the second dorsal: both fins terminate evenly, as far as concerns the tips of the posterior rays. The caudal forms the fifth of the total length. The ground color is olivaceous, but the upper regions appear blackish with isolated spots of the ground color; the inferior regions are unicolor.

Atherina storeri, Ayres, is my *ATHERINOPSIS CALIFORNIENSIS*.

RHACOCHEILUS TOXOTES, Agass., was identified on a specimen collected by E. Samuels in Tomales Bay.

HYSTEROCARPUS TRASKII, Gibbons, could be recognized on a specimen collected at Fort Reading by Drs. J. F. Hammond and John S. Newberry. Another specimen from the same locality had no irregular transverse bands of black, but was almost *unicolor*.

Another species of viviparous fish,

EMBIOTOCA ARGYROSOMA,

is easily distinguished from its congener by the brilliant argentine tint of its entire body, though made a little darker along the dorsal region by a greyish or pinkish hue. The general form is elongated; the head rather small, subconical, rounded anteriorly, and contained four times and a half in the total length. The caudal is deeply forked. The posterior extremity of the anal extends a little more posteriorly than the dorsal. The tips of the pectorals reach a vertical line passing beyond the origin of the anal. Specimens were collected at San Francisco, Cal., by Lt. W. P. Trowbridge, U. S. A.

OSMERUS ELONGATUS, Ayres, has been collected at San Francisco, Cal., by Dr. John S. Newberry. The specimens were identified by Dr. Ayres.

A most important (I was almost going to say unexpected) discovery of a white fish was made by the party on the R. R. Survey of California and Oregon, commanded by Lt. R. S. Williamson. And since it is different from its hitherto known congener, we will call it

COREGONUS WILLIAMSONI,

as commemorative of that Survey. Its head is rather small, being contained about five times in the total length, which measures eleven inches. The mouth is very small and the posterior extremity of the maxillary does not extend as far back as the anterior rim of the orbit. The scales are large; eighteen rows of them may be counted between the anterior margin of the dorsal and the insertion of the ventrals: nine above the lateral line, and eight below it. The lateral line, itself, is perfectly straight. The caudal fin forked as usual. The pectorals are rather small. I have alluded to the color in saying it was a white fish; add to it a bluish grey hue along the back. It was collected by Dr. Newberry in the Des Chutes river, a tributary of the Columbia.

In adding a second species to the genus *Platichthys*, the diagnose of this genus must be modified so as to read: "eyes on either the right or left side," for

PLATICHTHYS UMBROSUS,

which is the new species referred to, has its eyes on the right, whilst in the species formerly described, they are on the left. It can also readily be distinguished from its congener in having the body completely covered with scales, on the surface of some of which prickles or asperities are observed. The specimen before us measures seven inches and a half, is of a uniform blackish brown hue on the right side and light brown on the left. It was collected by Lt. W. P. Trowbridge, U. S. A., at Cape Flattery, W. T.

I have likewise a second species to add to my genus *Pleuronichthys*, taking this opportunity of correcting a *lapsus linguae* which occurred in the diagnosis of its generic characters: "teeth very inconspicuous, occupying the colorless side of the jaws," instead of both sides of the jaw. That this was a mere accident will appear obvious by reading the characters given to *Parophrys*, in which an allusion is made to the true state of things in *Pleuronichthys*.

PLEURONICHTHYS GUTTULATUS,

appears to be a smaller species than its congener; it is also deeper, less elongated, hence more of a subcylindrical general form. The eyes are situated on the right side. The origin of the dorsal fin is not quite even with the anterior margin of the orbit, and in that respect the generic diagnosis will undergo a slight modification. The largest specimens observed measure a little over three inches. The ground color appears greyish black, over which are scattered light spots appearing like as many drops irregularly dispersed. Specimens were collected in Tomales Bay by E. Samuels.

A specimen of *Ophidium*, in a too precarious state of preservation to be determined specifically, was found by Lt. W. P. Trowbridge, at S. Farallones, near San Francisco. Another was collected by Dr. Suckley at Shoalwater Bay, W. T., apparently of the same species.

We have also to mention a *Sandlaunge*, under the name of

ANMODYTUS PERSONATUS,

the general aspect of which is shorter than its congeners, although the form and outline of the body are not materially different. We perceive no teeth on the palat. The posterior extremity of the maxillary extends to a vertical line which intersects the anterior rim of the orbit. The origin of the dorsal fin is situated anteriorly to the tips of the pectorals. The base of the caudal fin is black. Specimens were collected at Cape Flattery, W. T., by Lt. W. P. Trowbridge, U. S. A.

STYGNATHUS CALIFORNIENSIS, Storer,

was received from Monterey, Cal., through the care of A. S. Taylor. The specimen is somewhat imperfect; it is the largest of those which we have examined from the Pacific coast.

ACCIPENSER ACUTIROSTRIS, Ayres,

was brought home by Dr. Newberry, the specimen having been labelled by Dr. Ayres in San Francisco, where the specimen was procured.

ACCIPENSER MEDIOROSTRIS, Ayres, was received in the same manner as the preceding.

ACCIPENSER TRANSMONTANUS, Rich., from the Columbia river, has been collected by Dr. Suckley.

We conclude by referring to a ray of a remarkable genus,

RHINOPTERA VESPERTILIO,

which was caught in Tomales Bay, by E. Samuels. The specimen before us measures nineteen inches and a half from the extremity of the mouth to the tip of the tail, six inches and three quarters being the length of the body and head together. The width from the tip of one pectoral fin to the other is twelve inches. There is a small dorsal fin situated upon the anterior portion of the tail, followed by a flattened spear shaped spine, serrated upon its edge. The tail is very attenuated, flagelliform, tapering into a filiform extremity. The cephalic region is as long as the rest of the body. Its anterior outline is rounded. The eyes are very prominent and somewhat raised above the surface of the head. The respiratory apertures, five in number are transversally elongated and arranged upon an open curve. The lips are fringed. The color is of an uniform bluish slate above; dull whitish beneath.

Mr. Ord, on behalf of the Committee appointed to procure subscriptions to the Wilson Monument Fund, reported that he had received and transmitted in the name of the President and Members of the Academy, the sum of \$280. From persons not members, he had received and transmitted the sum of \$35. The report was adopted and the Committee discharged.

Mr. Cassin, on behalf of the Committee appointed to prepare a correct list of the Correspondents of the Academy, reported progress and requested a continuance; which request was granted.

The Corresponding Secretary presented his report for the last month.

ELECTION.

Dr. Charles S. Boker, Mr. John McAllister, Jr., and Dr. Samuel S. Garrigues, all of Philadelphia, were elected *Members*.

Dr. Morris* stated that Alexis St. Martin, on whom Dr. Beaumont performed his celebrated series of experiments, is now in town, and has been submitted to some experiments at the Pennsylvania College by Dr. F. G. Smith, in the presence of a few physicians. On Monday last, after breakfasting on bread and butter and coffee, he partook at 10½ A. M., of beefsteak; at the expiration of two hours the fluid contents of the stomach were withdrawn by means of a catheter. They had a decidedly acid reaction, but whether from chlorohydric or lactic acid, I was unable to ascertain from the small quantity forwarded to me for examination. The meat was rapidly being converted into chyme; small flocculi floated in the fluid and collected at the bottom, much paler than natural. On being subjected to the microscope, the cellular tissue had nearly all disappeared, while the muscular fibres exhibited all stages of disintegration; some were found nearly of the usual color, some paler and with the transverse striæ beautifully marked. As the latter became less evident, longitudinal striation exhibited itself, while a minute punctation took the place of the transverse striæ. As the digestive process advanced, the whole fibril became granular, but the longitudinal striation remained as long as there was any evidence of the structure. This goes to confirm the view of the minute anatomy of the muscles maintained by Kölliker, in opposition to Todd and Bowman's disc theory. The nuclei of the ruptured gastric cells, epithelium from the mouth, esophagus and stomach, with numerous fat granules, completed the microscopic appearances. This morning, at 10½ A. M., he partook of bread, and the fluid being withdrawn as before at the end of two hours, presented the following appearances: The supernatant fluid resembled a starch solution, but on close examination gave the faintest possible evidence of starch by the iodine test, which I am disposed to regard as due mainly to the dextrine present. Trommer's test gave abundant proof of the presence of the latter, or of grape sugar, or both, and also indicated by the purplish hue of the liquid on the addition of sulphate of copper and potassa to the fluid, the presence of a protein body. The remnants of the bread, fully disintegrated, subsided to the bottom, and showed abundant evidence of starch. So far as this experiment goes, it confirms the views generally held as to the action of the saliva upon amylaceous bodies, in contravention to those advanced by Lehmann, as to the active part played by the intestinal fluid (the secretion of the intestinal mucous membrane) in digestion. The greater part of the bread had disappeared, giving place to grape sugar, in consequence of the almost momentary action of the saliva, and leaving mainly the function of absorption to be performed by the intestinal mucous membrane.

*This communication being mislaid, could not be introduced into its proper place, under date of May 6th.

July 1st, 1856.

DR. J. CARSON in the Chair.

A letter was read from Rudolph C. Burlag, Consul of the Netherlands, dated New York, June 26th, 1856, enclosing a letter from *The Society for the Succor of Drowned Persons*, of Amsterdam, dated March 21st, 1856, transmitting their publication acknowledged this evening.

Dr. Uhler remarked, that the specimen of Deweylite presented by himself this evening, has exactly the composition of the precious serpentine and resembles chalcodony.

On leave granted, Dr. Rand moved that the Committee on Mr. Girard's paper, entitled "Contributions to the Ichthyology of the western coast of the United States," be allowed to present their report. The motion was adopted. The Report of the Committee in favor of publication in the forth-coming number of the Proceedings, was then received and adopted.*

July 8th.

DR. BRIDGES, Vice President, in the Chair.

Letters were read—

From Dr. E. K. Kane, acknowledging the receipt of the special vote of thanks of the Academy.

From H. G. Bronn, dated Heidelberg, 5th January, 1856, acknowledging the receipt of the Journal of the Academy, (N. S. Vol. iii., No. 1,) and a copy of Dr. Leidy's paper on the Extinct Sloth Tribes of North America; also transmitting donations.

From the Zoologische Botanischen Verein of Vienna, dated 12th December, 1855, transmitting donations.

From the Imperial Society of Naturalists of Moscow, dated March 29, 1856, acknowledging the receipt of the Proceedings, (Vol. vii., No. 1,) of the Academy.

A paper was presented for publication in the Proceedings, entitled "On a new Genus and Species of Urodela, from the collections of the U. S. Exploring Expedition, under Com. Charles Wilkes, U. S. N., by Charles Girard, M. D.;" referred to a Committee consisting of Mr. Cassin, Dr. Brinton, and Dr. Bridges.

Mr. Lea presented for publication in the Proceedings, a paper entitled "Description of fifteen new species of Exotic Melaniana, by Isaac Lea;" referred to a Committee consisting of Mr. Vaux, Dr. Leidy and Mr. Gliddon.

Dr. Leidy mentioned that the skin of the Musk Ox, deposited by Dr. E. K. Kane, the skeleton of an Owl, presented by the same, the skin of the Llama, presented by Dr. Ruschenberger, and the skeleton of the large specimen of *Chelonura serpentina*, presented by Mr. Tiffany, of Cape May co. N. J., had been mounted and placed in the collection.

* See page 131.

Mr. Ord transmitted a letter from Matthew BARR, dated Paisley, 21st June, 1856, acknowledging the receipt of £64 11s. 7d. as a contribution to the Wilson testimonial fund.

Dr. Leidy stated, that in consequence of the unsatisfactory results of his investigations, which had formed the subject of "A Memoir on the Extinct Dicotylinae of America,"* from the time of writing that memoir he had been collecting material, both recent and fossil, towards a more positive determination of the number of extinct species of Dicotylinae. The results of his subsequent investigations appear to be as follows:

1. The extent of variation in the characters of the skull, and especially of the teeth, is as great in different individuals of the recent *Dicotyles torquatus*, as it is in all the extinct genera and species heretofore indicated by Dr. Le Conte and himself.

2. The evidence, so far as it has been derived from osteological characters, appears to refer all the extinct genera and species of North American Dicotylinae, as heretofore indicated, to one single species.

The name of the latter and its synonyma are as follows:

DICOTYLES COMPRESSUS, Leidy.

Syn. *Platigonus compressus*; *Hyops depressifrons*; *Protochoerus prismaticus*; *Dicotyles depressifrons*; *Dicotyles costatus*, Le Conte. *Euchoerus macrops*, Leidy.

July 15th.

DR. BRIDGES, Vice President, in the Chair.

A paper was presented for publication in the Proceedings, entitled "New species of *Hyla*, by John Le Conte," which was referred to a Committee consisting of Dr. Hallowell, Mr. Cassin and Dr. J. A. Meigs.

July 29th.

Vice President BRIDGES in the Chair.

The Committee on Dr. Girard's paper, read 8th inst., reported in favor of publication in the Proceedings; which report was adopted.

On a New Genus and Species of URODELA, from the collections of the U. S. Expl. Exped., under Comm. Charles Wilkes, U. S. N.

By CHARLES GIRARD, M. D.

A species of this group was collected in Oregon by the U. S. Exploring Expedition, showing such a striking external resemblance with *Aneides lugubris*, that upon a first examination we referred it to the latter genus. A closer examination of its structure made us acquainted with an ensemble of characters which has induced us to establish a genus distinct from *Aneides*: by the shape of the mouth, which is linear, instead of being undulating; by the maxillary teeth, which are exceedingly minute, and the disposition of the vomero-palatine teeth, upon a double ogee, instead of an obtuse angled triangle.

HEREDIA.

Head subelliptical, broader than the body; snout blunt and rounded, protruding beyond the lower jaw. Cleft of the mouth oblique and rectilinear. Maxillary teeth exceedingly minute, scarcely perceptible. Vomero-palatine teeth dis-

posed upon a double ogee extending from the middle line of the palate along the anterior inner edge of the orbit. Sphenoid teeth forming two elongated patches. Tongue large, elliptical, attached by an elongated central pedicel, and free upon its posterior third. Eyes large. Limbs slender, anterior ones longest; four fingers; five toes, all free and tapering. Tail subcylindrical, slightly compressed, tapering towards the tip. Skin exteriorly smooth and soft.

HEMIEDIA OREGONENSIS.—Tail longer than the body and head together. Fingers and toes slender and free, inner one very small. Skin smooth, uniform dark brown above, lighter beneath.

The Secretary read a note from Dr. Wm. S. Zantzinger, dated 29th July, 1856, stating that he was about to remove from the city, and consequently tendered his resignation as Librarian of the Academy. The resignation was accepted.

ELECTION.

Baron John William Von Müller, of Stuttgart, was elected a Correspondent, and Mr. Alfred Cope and Dr. Wm. H. Gobrecht, both of Philadelphia, were elected members of the Academy.

August 5th.

Vice President BRIDGES in the Chair.

Dr. Hallowell presented for publication in the Proceedings, a paper entitled "Notes on the Reptiles in the collection of the Academy of Natural Sciences of Philadelphia, by Edward Hallowell, M. D.;" also a paper entitled "On several new Reptiles in the collection of the Academy of Natural Sciences of Philadelphia, by Edward Hallowell, M. D." Both these papers were referred to a Committee consisting of Dr. Leidy, Mr. Cassin and Mr. Schafhirt.

Dr. Hallowell exhibited numerous specimens of the larvæ of *Bufo Americanus*. These were caught by Dr. Leidy on the 16th of June, along the banks of the Schuylkill, near Philadelphia. They are nine lines in length, including the tail, of a slate color above, with dark colored spots; the under parts are whitish mingled with gray. The reason why the tadpoles of the toad are not more often seen, is probably on account of their small size. Specimens of the perfect animal were also exhibited; these were six lines in length, of a grey color above, with numerous small dark colored spots, containing each one or more minute reddish colored ones; these smaller spots were also distributed over the body; under parts whitish; the perfect specimens were found July 7th, 1856, among stones quite close to the river.

Dr. Hallowell also exhibited a number of specimens of *Rana halecina*, Kalm, found in the neighborhood of Philadelphia, both male and female. The females appear to be of a somewhat lighter color than the males, and have fewer spots. The latter are all provided with a vocal sac, one on each side, communicating with a small circular opening, not quite a line in diameter, beneath the lower jaw near its angle, nearly opposite the eustachian foramina.

Duméril and Bibron, in their *Erpetologie Générale*, tom. viii., p. 353, remark, that in comparing the *Rana esculenta* of Europe, and the *Rana halecina*, the first thing to be observed is, that the *Rana halecina* is not provided at the angles of the mouth with those slits which permit the males to extend their vocal sacs,

from the middle of which project the two last phalanges, which are slender. Inferior surface of this disk covered with imbricate feuillets, for the most part, arranged *en chevron*. A longitudinal band of large plates under the tail. (Duméril et Bibron.)

The Hemidactyles are divided by Duméril and Bibron into two sections. 1, the Dactyloperes, with thumbs, as it were, truncated, of which there are two groups—A, with entire subdigital laminae, and B, with divided (echanchrées) subdigital laminae; and 2d, the Dactyloteles, or with five complete fingers narrowed at the point. These are also divided into two groups—A, the D. fissipedes, and B. the D. palmipedes, the latter only having palmated fingers, and comprising but two species, viz.: H. marginatus and H. sebæ; the former, or the fissipedes, thirteen, inhabiting Malabar, (triædrus.) Philippines, Isle Maurice, Bombay, (maculatus,) border of the Mediterranean, Toulon, Rome, Sicily, Greece, Senegal. Trebizonde, Chili, Vera Cruz, Buenos Ayres, (vermiculatus,) W. Indies, Cayenne, Brazil, Carthagena, Martinique, (mabouia,) Ceylon, (Leschenaultii,) Bengal, Bombay, (Coctæi,) S. Africa, Indian Archipelago, Madagascar, Isle of France, Ceylon, Amboina, Java, Timor, Marianne Islands, (frenatus,) Otaheite, (Garnotii,) and Peru (Peruvianus.)

Sect. Dactyloteles fissipedes, D. & B. (Five nails, fingers and toes free.)

HEMIDACTYLUS FORMOSUS, nob.

Char. Nine inferior labial plates, the two first the largest; mental plate broad, triangular, immediately behind it two quadrangular plates, much smaller than the mental; ten superior labials; 17 femoral pores on each thigh in the males; a broad dark colored blotch bordered with white, upon the back, extending in the form of a crescent to the posterior margin of the orbit; three broad quadrangular brownish blotches, margined with white, upon the back; tail banded with brown; 9 or 10 rows of circular tubercles on each side of the median line of the body.

Description. The head of this remarkable species is large, swollen at the temples, presenting a marked depression along its middle. The nostrils are situated immediately behind the rostral plate, a little above the first labial, and are somewhat triangular in shape; between them, and in contact, are two small narrow plates, behind the rostral, with a smaller one intermediate; the head is covered with small granulations superiorly, the front with tubercles; of the ten superior labial plates, the first is the largest; the inferior margin of the eyelid passes beneath the globe of the eye, the superior above it, and is covered with small granulations and rhomboidal scales, its external border denticulated; body and extremities robust, the former covered with granulations, with nine or ten longitudinal rows on each side of the median line of circular tubercles; elbows and posterior surface of forearms covered with granulations; arms anteriorly and beneath with scales; the fingers and toes are each provided with a nail, free; eight subdigital laminae beneath the fourth finger; no lateral membranes to the body or tail. Chin and throat covered with granulations; abdomen and under part of extremities with quadrangular scales; 17 to 19 pores along the under part of each thigh, in the males, none in front of the anus; tail long and tapering, much longer than body, (1½ inches,) presenting beneath a well-defined central row of hexagonal scales, much broader than long, bordered on each side with smaller scales irregularly disposed.

Coloration. Ground color above dusky white, with a tinge of reddish brown, the brownish red tints predominating; a large dark brown blotch upon the neck bordered thinly with white, with crescentic prolongations reaching to the posterior margin of the eye; three broad transverse brown blotches (3 to 3½ lines) upon the back, bordered with white, and separated from each other by interspaces of about the same length as the blotches; tail banded with brown above and upon the sides.

Dimensions. Length of head 7 lines; greatest breadth 7; length of neck and body to arms 2 inches 1½ lines; length of tail 3 inches 4 lines; total length 6 inches 4½ lines.

Habitat. Liberia, west coast of Africa. Three specimens presented by Dr. Savage.

The young is of a very light straw color above, with three transverse bands about two lines in breadth, of a beautiful yellow color; blotch upon neck similar in form to that of adult, but of a beautiful light yellow color; under parts straw color; no minute black points upon the scales.

Dimensions of a young specimen. Length of head 6 lines; greatest breadth $3\frac{1}{2}$; length of neck and body to tail 1 inch 3 lines; (tail mutilated.)

The *Gymnodactyles* are separated by Duméril and Bibron into two divisions, viz., the *Gymnodactyles homonotes*, in which the scales of the back are equal, and into *Gymnodactyles heteronotes*, in which the upper parts of the body are sprinkled with tubercles more or less developed. The species now described belongs to the latter division.

Gen. GYMNOTACTYLUS.

Char. Five nails not retractile to all the feet; toes not dilated transversely, nor denticulated upon their edges; the fifth of the posterior toes versatile, or capable of being removed from the others at a right angle. (Duméril et Bibron, tome 3, p. 408.)

GYMNOTACTYLUS TENUIS, nob.

Char. Head rather long, front depressed; nine inferior labial plates, the four first broader than the others; two plates behind the mental, followed by three others in contact with the labials, not so large; ten superior labials; rostral broader than long; two quadrangular oblique plates posterior to it, with a smaller one between them; nostrils circular, their inferior border in contact with the first labial, the anterior margin formed by the quadrangular plates above described, the posterior by a small semi-circular scale, the superior by a small irregularly shaped plate; head covered with smooth granulations, somewhat larger upon the sides; the eyebrow presenting numerous quadrangular scales, forms a complete circle around the eye; auricular openings oval, without denticulations; extremities quite slender; fingers and toes slender, each provided with a small recurved nail, with the exception of the thumb; scales beneath the fingers and toes single; body slender; tail longer than body, tapering to a point, with a row of broad scales beneath.

Coloration. Brownish above, upon the body, lighter beneath; tail yellowish, banded with brown.

Measurements. Length of head 7 lines; greatest breadth 4; length of body 1 inch, (Fr. ;) of tail 1 inch $2\frac{1}{2}$ lines.

Habitat. Manila. One specimen presented by Dr. Burroughs.

Fam. VARANIDÆ.

LEZARDS VARANIENS OF SAURIENS PLATYNOTES, D. & B.

We do not find among the Varanians in the collection of the Academy any which appear to be new, with the exception of the specimen now described, presented several years ago by Dr. Kane. The Museum at present contains the following species, viz., *V. niloticus*, (10 specimens,) *V. bengalensis*, (3 sp.,) *V. bivittatus*, (4 sp.,) *V. Piquotii*, (2 sp.,) *V. arenarius*, (1 sp.,) *V. ocellatus*; (1 sp.,) the two last from the Garden of Plants in exchange. The specimen presented by Dr. Kane is the largest, by far, in the collection, and of greater dimensions than those of any of the Varanians, with the exception of the gigantic lace lizard of N. Holland, (*Hydrosaurus giganteus*, Gray.) described by Mr. Gray in the "Zoology" of the Erebus and Terror, part vi., Feb., 1845, 6 $\frac{1}{2}$ feet in length.

August 19th.

MR. CASSIN in the Chair.

Mr. Cassin presented a paper entitled, "Descriptions of New Species of African Birds in the Museum of the Academy of Natural Sciences of Philadelphia, collected by Mr. P. B. DuChaillu in Equatorial Africa. By John Cassin." Referred to a Committee consisting of Drs. Wilson, Morris and Rand.

Mr. Cassin also announced the reception of a collection of Mammals, Birds and Shells from Mr. P. B. DuChaillu, who had begun his labors in Western Africa.

August 26th.

Vice President BRIDGES in the Chair.

The Committees on Mr. Lea's paper, read July 8th; on Major Le Conte's paper, read July 15th; on Dr. Hallowell's papers, read August 5th; and on Mr. Cassin's paper, read August 19th, severally reported in favor of publication in the Proceedings.

Description of Fifteen new species of Exotic Melaniana.

By ISAAC LEA.

MELANIA VERREAUIANA. Testâ lævi, pyramidatâ, crassâ, tenebroso-castaneâ, spirâ valdè elevatâ; suturis linearibus; anfractibus planulatis; aperturâ subgrandi, ovatâ, intus paulisper brunneâ; columellâ albâ incurvaque.

Hab. Sandwich Islands. M. E. Verreau, Paris.

MELANIA FRATERNA. Testâ plicatâ, pyramidatâ, subcrassâ, tenebroso-brunneâ; spirâ elevatâ; suturis irregulariter impressis; anfractibus subplanulatis, transversim lineis impressis, regulariter cinctis, costellis verticalibus; aperturâ parvâ, subovatâ, intus albidâ; labro acuto; columellâ contortâ, superne incrassatâ, infernè subemarginatâ.

Hab. ———.

MELANIA HAINESIANA. Testâ lævi, pyramidatâ, subtenui, corneâ; spirâ subelevatâ; suturis linearibus, impressis; anfractibus planulatis, in medio angulatis; aperturâ subgrandi, subrhomboideâ, ad basim angulatâ, intus cœruleo-albidâ; labro acuto, angulato; columellâ albidâ torta que.

Hab. India. W. A. Haines, New York.

MELANIA HOUSEI. Testâ lævi, acuto-conoideâ, tenui, corneâ, flammis longitudinalibus ferrugineis ornatâ; spirâ subelevatâ; acuminatâ, suturis impressis, canaliculatisque; anfractibus planulatis, instar duodecim; aperturâ parvâ, ovatâ, intus albidâ; columellâ albâ torta que.

Operculo tenebroso-fusco.

Hab. Korat, Takrong River, Siam. S. R. House, M. D.

MELANIA NINGPOENSIS. Testâ perplicatâ, striis transversis crebris decussatâ, conoideâ, tenui, pallidâ corneâ, subdiaphanâ; spirâ subelevatâ; suturis valdè impressis; anfractibus instar novem, subconvexis, infernè transversim costatis; aperturâ parvâ, subrotundatâ, intus albâ; columellâ albâ.

Operculo tenui, pallido-corneo.

Hab. Ningpo, China. S. R. House, M. D.

MELANIA MYRRIANA. Testâ plicatâ, conoideâ, tenui, disphanâ, rufo-corneâ; spirâ subelevatâ; suturis impressis; anfractibus instar octo, subconvexis, striis exilissimis impressis; aperturâ ovatâ, supernè angulatâ, ad basim unifasciatâ; labro acuto; columellâ albidâ.

Hab. Feege Islands. S. R. House, M. D.

MELANIA BULLATA. Testâ striatâ, obtuso-conoideâ, valdè inflatâ, crassâ, nigrâ; spirâ curtâ, truncatâ; suturis paulisper impressis; anfractibus convexis, striis transversis subdistantibus, impressis; aperturâ grandi, subovatâ, supernè angulatâ et incrassatâ, intus albidâ; labro acuto; columellâ incurvâ tortaue.

Hab. Brazil. W. A. Haines.

MELANIA LYRÆFORMIS. Testâ plicatâ, conoideâ, subcrassâ, tenebroso-fuscâ; spirâ curtâ; suturis irregulariter impressis; anfractibus convexiusculis, supernè regulariter costatâ, infernè transversim striatâ; aperturâ parvâ, ellipticâ, intus albidâ; labro acuto; columellâ incurvâ tortaue.

Hab. Manilla. W. Newcomb, M. D.

MELANIA AFFINIS. Testâ crebri-striatâ, conoideâ, subtenui, tenebroso-fuscâ; spirâ subelevatâ; suturis impressis; anfractibus convexis, ad apicem plicatâ aperturâ parvâ, ellipticâ, intus albidâ; labro acuto; columellâ lævi et incurvâ.

Hab. Manilla. W. Newcomb, M. D.

MELANIA AUSTRALIS. Testâ crebri-plicatâ, attenuatâ, tenui, nigracanti; spirâ elevatâ; suturis impressis; anfractibus planulatis, supernè canaliculatis; aperturâ parvâ, ellipticâ, supernè obtuso-angulatâ, intus tenebrôsâ; labro-acuto; columellâ albâ tortaue.

Hab. Manilla. W. Newcomb, M. D.

MELANIA NEWCOMBI. Testâ striatâ, acuto-conoideâ, tenui, corneâ; spirâ subelevatâ; suturis impressis canaliculatisque; anfractibus instar novem, subconvexis, striis exilissimis impressis; aperturâ parvâ, ellipticâ, intus albidâ; labro acuto; columellâ albidâ.

Operculo tenebroso-fusco.

Hab. Oahu, Sandwich Islands. W. Newcomb, M. D.

MELANIA MACIENSIS. Testâ cancellatâ, infernè transversè striatâ, conoideâ, acuminatâ, subcrassâ, corneâ; spirâ elevatâ; suturis irregulariter impressis; anfractibus denis, planulatis, ad apicem crebri plicatâ; aperturâ grandi, ovatâ, supernè angulatâ, intus coruleâ albâ; labro expanso, acuto; columellâ tortâ.

Hab. Maui, Sandwich Islands. W. Newcomb, M. D.

MELANIA BONINENSIS. Testâ cancellatâ, conoideâ, tenui, tenebroso-corneâ; spirâ subelevatâ; suturis paulisper impressis; anfractibus planulatis, instar septenis; aperturâ parvâ, ovatâ, supernè angulatâ, intus albidâ; labro acuto; columellâ tortâ.

Hab. Bonin Islands. M. Burrough, M. D.

MELANIA RUBIDA. Testâ striatâ, conicâ, crassâ, ferrugineâ; spirâ subelevatâ, acuminatâ; suturis impressis; anfractibus undenis, planulatis, ultimo inflatis, ad apicem carinatis; aperturâ subgrandi, rotundâ, intus rubicundulâ; labro acuto; columellâ incrassatâ.

Hab. Mexico. Hon. J. R. Poinset.

PACHYCHILUS PARVUM. Testâ striatâ, obtuso-conoideâ, crassâ, ferrugineâ; spirâ curtâ; suturis impressis; anfractibus senis, convexis, striis transversis exilissimis impressis; aperturâ grandi, subrotundâ, intus albâ; labro expanso, valdè incrassato; columellâ incrassatâ.

Operculo diaphano, elliptico.

Hab. Siam. S. R. House, M. D.

Description of a new species of Hyla from Georgia.

By JOHN LE CONTE.

During the last spring, whilst I was residing in the lower country of Georgia, it was my good fortune to meet with three specimens of the animal described below. One of them was taken in the water of a pine barren pond, another was found in a cavity of a sand pit, and the third upon a tree in the forest.

This *Hyla* is remarkable for its size, approaching in this respect to those found in tropical regions. Two of them were of a greenish dusky; the second, who had concealed himself in a hole in the sand, was of a bright pea green, but in the space of half an hour changed to the color of the others, thus showing a complete possession of the faculty of changing color at will, so remarkable in many of the *Batrachia*.

There yet remain undiscovered and undescribed, in Georgia, three species of this genus, which have as yet eluded my search. The notes of these are remarkably distinct from those of others; I may hereafter be fortunate enough to obtain them.

HYLA GRATIOSA.

Coarsely granulate both above and beneath. Color above varying at the will of the animal from bright green to cinereous and to greenish dusky, with roundish spots or irregular blotches of darker, or speckled with variously shaped dots of the same, all of them with some few small yellow irregularly disposed spots on the back and sides. Beneath whitish, more or less inclining to yellow or orange. Upper lip white, or white varied with green or dusky; lower lip sometimes whitish, at others of the color of the back; in some a white line extends from the upper lip along the side to the insertion of the hind leg, in others the sides are variegated with rounded spots of darker, and no line visible. Irids black varied with golden; tympanum copper-colored, a considerable depression between the nostrils and the eyes. Chin varied with dusky or green, with a slight fold at the bottom; transverse space between the arms smooth, without any granulations. Arms and legs barred, with darker, yellowish or reddish on the under side, the former smooth beneath, the latter granulate on the posterior half; the under side of the posterior half of the thighs is smooth. Disks of the toes very large.

Length of head and body 2·5 inches; humerus ·6; antibrachium ·6; hand ·75; femur 1·2; tibia 1·15; foot 1·6.

Notes on the Reptiles in the collection of the Museum of the Academy of Natural Sciences.

By EDWARD HALLOWELL, M. D.

It is not surprising that, among the reptiles of the Academy, which it has required more than forty years to bring to its present although incomplete condition, and which is now for the first time in process of classification and arrangement, there should be many new species that do not appear to exist even in the large European collections. It is possible, however, that some of these may be mere varieties, or they may be already known; but after careful inquiry, I have not been able to make them out as such, and the interests of science, it appears to me, will be best subserved by their publication, even should the account of them hereafter be found to contain a few errors.

FAM. CAMELEONIDÆ.

LÉZARDS CAMÉLÉONIENS ou SAURIANS CHÉLOPODEL, Dum. et Bib.

Among the *Cameleonidæ* in the collection of the Academy, we find two which differ from any of those described in the work of Duméril and Bibron, and in the Memoir of Prof. Aug. Duméril, in the *Archiv. du Muséum*, tome vi., p. 210. Neither are they found in the Catalogue of the Lacertians of the British Museum,



HYLA GRATIOSA, Le Conte

in form by W^m E. Hitchcock.

Drawn by J T Bowen, Phil



by Mr. Gray. They may be new species, or only varieties of those already determined. Future and more extended observation will settle this point.

CHAMÆLEO GRANULOSUS, nob.

This Chameleon is much larger than any of the specimens we have of *dilepis* or of *gracilis* from W. Africa, resembling somewhat in size the *Ch. pardalis* of Madagascar, but it is not so stout.

Char. Outline of head above oval, somewhat narrower in front than posteriorly; lateral crests not meeting in front; central keel very low, hardly perceptible; spaces on each side, between it and the lateral crest, depressed, slightly rounded, occupied with polygonal tubercles of unequal size; supraciliary ridge high, subcircular; back and upper part of tail denticulated, the denticulations larger near the neck, having there the form of a crest; a crest upon chin, throat and abdomen, none under the tail. Scales upon sides unequal, tubercular; four or five rows of flat quadrangular scales between the dorsal denticulations and the lateral tubercles.

Description. The outline of the head above resembles that of *Chamæleo senegalensis*, but is less narrow in front; the supraciliary crest is also much more elevated; it differs from *gracilis* in having a trace only of the bifurcations of the central keel, and in being covered with tubercles and smooth polygonal scales; the scales, both upon the head and sides of the body, are larger and more tubercular than in *Senegalensis*, the general shape of the head is different, and the present species is considerably larger. It may, however, be only a variety of *Senegalensis*, or perhaps the male. Color greyish, with a tinge of blue upon the abdomen.

Dimensions. Length of head 1 inch 7 lines; breadth above, between the supraciliary crests, 7 lines; length of neck and body to vent 4 inches; of tail 5 inches; total length 10 inches 7 lines.

Habitat. West Africa. One specimen presented by Mr. Cassin.

CHAMÆLEO BURCHELLI.

Char. Rather larger than *C. dilepis*. Outline of head above resembling somewhat that of *Chamæleo pardalis*, but less narrow, prolonged, with lateral crests much more depressed and the interspace more shallow; central keel very low, interspace between it and lateral crests occupied with flattened polygonal scales of unequal size; supraciliary ridge low, the lateral crests not in contact anteriorly; scales upon the sides of the head rather large, flattened, with a slight elevation in the centre, polygonal; back denticulated, more slightly posteriorly; a few spines upon neck; throat and abdomen denticulated; scales of body unequal, tubercular, general shape subrhomboidal, interspersed with very small granules.

Color. In specimen examined greenish, with a lateral yellow stripe.

Dimensions. Length of head 1 inch 5 lines; breadth between supraciliary ridges 6 lines; length of neck and body to vent 3 inches 7 lines; length of tail 4 inches 9 lines; total length 9 inches 9 lines.

Habitat. Fernando Po. One specimen presented by Dr. Burt, U. S. N.

GECKOTIDÆ.

LÉZARDS GECKOTIENS, ou SAURIENS ASCALABOTES, D. & B.

The family Geckotidæ are divided by Dumeril and Bibron into seven genera—1, *Platydictylus*; 2, *Hemidactylus*; 3, *Ptyodactylus*; 4, *Phyllodactylus*; 5, *Sphaeriodactylus*; 6, *Gymnodactylus*; 7, *Stenodactylus*. The Geckotians described in this paper belong to the genera *Hemidactylus* and *Gymnodactylus*, the former thus characterized:

HEMIDACTYLUS, Cuvier, Gray, Wagler, Weigmann.

Char. Base of the four or five fingers of each extremity enlarged into a disk,

from the middle of which project the two last phalanges, which are slender. Inferior surface of this disk covered with imbricate feuillets, for the most part, arranged *en chevron*. A longitudinal band of large plates under the tail. (Duméril et Bibron.)

The Hemidactyles are divided by Duméril and Bibron into two sections. 1, the Dactyloperes, with thumbs, as it were, truncated, of which there are two groups—A, with entire subdigital laminæ, and B, with divided (echanchrées) subdigital laminæ; and 2d, the Dactyloteles, or with five complete fingers narrowed at the point. These are also divided into two groups—A, the D. fissipedes, and B. the D. palmipedes, the latter only having palmated fingers, and comprising but two species, viz.: *H. marginatus* and *H. sebæ*; the former, or the fissipeds, thirteen, inhabiting Malabar, (triædrus.) Philippines, Isle Maurice, Bombay, (maculatus,) border of the Mediterranean, Toulon, Rome, Sicily, Greece, Senegal. Trebizonde, Chili, Vera Cruz, Buenos Ayres, (vermiculatus,) W. Indies, Cayenne, Brazil, Carthage, Martinique, (mabouia,) Ceylon, (Leschenaultii,) Bengal, Bombay, (Coctæi,) S. Africa, Indian Archipelago, Madagascar, Isle of France, Ceylon, Amboina, Java, Timor, Marianne Islands, (frenatus,) Otaheite, (Garnotii,) and Peru (Peruvianus.)

Sect. Dactyloteles fissipedes, D. & B. (Five nails, fingers and toes free.)

HEMIDACTYLUS FORMOSUS, nob.

Char. Nine inferior labial plates, the two first the largest; mental plate broad, triangular, immediately behind it two quadrangular plates, much smaller than the mental; ten superior labials; 17 femoral pores on each thigh in the males; a broad dark colored blotch bordered with white, upon the back, extending in the form of a crescent to the posterior margin of the orbit; three broad quadrangular brownish blotches, margined with white, upon the back; tail banded with brown; 9 or 10 rows of circular tubercles on each side of the median line of the body.

Description. The head of this remarkable species is large, swollen at the temples, presenting a marked depression along its middle. The nostrils are situated immediately behind the rostral plate, a little above the first labial, and are somewhat triangular in shape; between them, and in contact, are two small narrow plates, behind the rostral, with a smaller one intermediate; the head is covered with small granulations superiorly, the front with tubercles; of the ten superior labial plates, the first is the largest; the inferior margin of the eyelid passes beneath the globe of the eye, the superior above it, and is covered with small granulations and rhomboidal scales, its external border denticulated; body and extremities robust, the former covered with granulations, with nine or ten longitudinal rows on each side of the median line of circular tubercles; elbows and posterior surface of forearms covered with granulations; arms anteriorly and beneath with scales; the fingers and toes are each provided with a nail, free; eight subdigital laminæ beneath the fourth finger; no lateral membranes to the body or tail. Chin and throat covered with granulations; abdomen and under part of extremities with quadrangular scales; 17 to 19 pores along the under part of each thigh, in the males, none in front of the anus; tail long and tapering, much longer than body, ($1\frac{1}{4}$ inches,) presenting beneath a well-defined central row of hexagonal scales, much broader than long, bordered on each side with smaller scales irregularly disposed.

Coloration. Ground color above dusky white, with a tinge of reddish brown, the brownish red tints predominating; a large dark brown blotch upon the neck bordered thinly with white, with crescentic prolongations reaching to the posterior margin of the eye; three broad transverse brown blotches (3 to $3\frac{1}{4}$ lines) upon the back, bordered with white, and separated from each other by interspaces of about the same length as the blotches; tail banded with brown above and upon the sides.

Dimensions. Length of head 7 lines; greatest breadth 7; length of neck and body to arms 2 inches $1\frac{1}{4}$ lines; length of tail 3 inches 4 lines; total length 6 inches $\frac{1}{2}$ lines.

Habitat. Liberia, west coast of Africa. Three specimens presented by Dr. Savage.

The young is of a very light straw color above, with three transverse bands about two lines in breadth, of a beautiful yellow color; blotch upon neck similar in form to that of adult, but of a beautiful light yellow color; under parts straw color; no minute black points upon the scales.

Dimensions of a young specimen. Length of head 6 lines; greatest breadth $3\frac{1}{2}$; length of neck and body to tail 1 inch 3 lines; (tail mutilated.)

The *Gymnodactyles* are separated by Duméril and Bibron into two divisions, viz., the *Gymnodactyles homonotes*, in which the scales of the back are equal, and into *Gymnodactyles heteronotes*, in which the upper parts of the body are sprinkled with tubercles more or less developed. The species now described belongs to the latter division.

Gen. GYMNOTACTYLUS.

Char. Five nails not retractile to all the feet; toes not dilated transversely, nor denticulated upon their edges; the fifth of the posterior toes versatile, or capable of being removed from the others at a right angle. (Duméril et Bibron, tome 3, p. 408.)

GYMNOTACTYLUS TENUIS, nob.

Char. Head rather long, front depressed; nine inferior labial plates, the four first broader than the others; two plates behind the mental, followed by three others in contact with the labials, not so large; ten superior labials; rostral broader than long; two quadrangular oblique plates posterior to it, with a smaller one between them; nostrils circular, their inferior border in contact with the first labial, the anterior margin formed by the quadrangular plates above described, the posterior by a small semi-circular scale, the superior by a small irregularly shaped plate; head covered with smooth granulations, somewhat larger upon the sides; the eyebrow presenting numerous quadrangular scales, forms a complete circle around the eye; auricular openings oval, without denticulations; extremities quite slender; fingers and toes slender, each provided with a small recurved nail, with the exception of the thumb; scales beneath the fingers and toes single; body slender; tail longer than body, tapering to a point, with a row of broad scales beneath.

Coloration. Brownish above, upon the body, lighter beneath; tail yellowish, banded with brown.

Measurements. Length of head 7 lines; greatest breadth 4; length of body 1 inch, (Fr. :) of tail 1 inch $2\frac{1}{2}$ lines.

Habitat. Manilla. One specimen presented by Dr. Burroughs.

Fam. VARANIDÆ.

LEZARDS VARANIENS OR SAURIENS PLATYNOTES, D. & B.

We do not find among the Varanians in the collection of the Academy any which appear to be new, with the exception of the specimen now described, presented several years ago by Dr. Kane. The Museum at present contains the following species, viz., *V. niloticus*, (10 specimens,) *V. bengalensis*, (3 sp.,) *V. bivittatus*, (4 sp.,) *V. Piquetii*, (2 sp.,) *V. arenarius*, (1 sp.,) *V. ocellatus*; (1 sp.,) the two last from the Garden of Plants in exchange. The specimen presented by Dr. Kane is the largest, by far, in the collection, and of greater dimensions than those of any of the Varanians, with the exception of the gigantic lace lizard of N. Holland, (*Hydrosaurus giganteus*, Gray.) described by Mr. Gray in the "Zoology" of the Erebus and Terror, part vi., Feb.; 1845, $6\frac{1}{2}$ feet in length.

VARANUS OLIVACEUS, nob.

Char. The head is large, pyramidal, broad posteriorly, slender and somewhat obtuse in front; the scales above the orbits are flattened, polygonal, several rows of unequal size, much larger than the rest, and three intermediate between the orbits and in front, still larger; the largest, however, are situated at the extremity of the snout above, and are placed in two transverse rows; the scales upon the back part of the head are more uniform in size; those upon the temples small; the nostrils are two oblique openings placed about midway between the extremity of the snout and the anterior canthus of the eye, their inferior extremity in a line with the latter; scales upon neck and body small, oval, surrounded with two rows of small granules, those upon the back more distinctly carinated, especially in its posterior part towards the tail, where the carinations are strongly developed; the scales upon the extremities are considerably larger than those upon the body, and likewise carinated, the posterior much more distinctly than the anterior; scales upon chin and throat smaller than the others, those upon under surface of extremities smooth; those upon abdomen slender, quadrangular, two lines in length, and about half a line in breadth, in transverse rows; tail circular, much longer than head, neck and body, surrounded with transverse rows of carinated elongate scales, with a slightly developed crest tapering gradually toward the end, where it is somewhat compressed; extremities well developed; fingers and toes provided with strong and powerful claws, third and fourth fingers of nearly equal length; transverse rows of large quadrangular scales beneath the fingers and toes, 16 rows beneath the second finger, 24 beneath the fourth.

Coloration. Ground color olive above, lighter below, with obscure dark colored spots and markings.

Dimensions. Length of head 5 inches, (Fr.) greatest breadth 3 inches; length of neck and body 1 foot 9½ inches; length of tail 3 feet; of arm 3 inches, of forearm 3 inches 4 lines; of thigh 3¾ inches; of legs 3½ inches; of longest finger, including nail, 3 inches 1 line. Total length 5 feet 2½ inches; circumference 1 foot 5½ inches.

Habitat. Manilla. One specimen presented by Dr. Kane, U. S. N.

Gen. Remarks. The species above described approaches nearest the *Hydrosaurus giganteus* of Mr. Gray, but is destitute of the transverse rows of ocellated spots upon the back, and the spots upon the extremities and tail. In Mr. Gray's species the shields over the orbits are very small and granular, but in the one just described there exist above the orbit several rows of polygonal scales, some of them a line in diameter, succeeded by several larger rows, and between these, four or five rows of broad hexagonal plates.

The *Varanidae*, divided into two sections by Duméril and Bibron, the terrestrial and aquatic, the former with a round tail and slightly developed crest, comprise two genera only, viz., *Varanus* and *Heloderma*, the former containing twelve, the latter but one species (*horridum*.)

None of this family exist in Europe, and but one is found in America, viz., *Heloderma horridum*, which inhabits Mexico. Of the others, four inhabit Asia, three Africa, and four Oceanica; of the latter, two New Holland, (*Bellii* and *varius*), one the Japan Islands, (*chlorostigma*), one Timor, (*Timoriensis*.) In Asia there are four species, viz., *Bengalensis*, *nebulosus*, *Diardii* and *bi-vittatus*. Three inhabit Africa, viz., *arenarius*, (*Egypt*), *niloticus*, (*Nile*, rivers of Cape of Good Hope, Sierra Leone, Liberia and Gaboon country), and *ocellatus*, (*Abyssinia* and *Senegal*.) With the exception of *bi-vittatus* and *olivaceus*, all these have small scales or granulations over the orbits.

Fam. IGUANIDÆ.

SAURIENS EUNOTES, Duméril et Bibron.

Gen. HOLOTROPIS.

Char. "Head in the form of a quadrangular pyramid; cephalic plates of moderate size, angular, almost equal; a very small occipital; supra-ocular scutella

dilated transversely; the other plates oblong; neck smooth below, folded irregularly upon the sides; an oblique fold of the skin before each shoulder; anterior edge of the ear denticulated; trunk subtriangular, covered with imbricated scales of medium size, provided with carinae, terminating in an acute point, and forming oblique lines converging towards the middle region of the back. A denticulated crest extending from the nucha to the extremity of the tail; the latter long, compressed; exterior edge of the two or three posterior fingers denticulated; no pores either in front of the anus or upon thighs." (D. et B.) Of this genus two species are described by Duméril and Bibron, viz., *Herminieri* and *Microlophus*; the first with a well developed crest and carinated ventral scales, the second with a very small crest and smooth ventral scales. In the first species the tail is strongly compressed, in the second very slightly. The species described in this paper was deposited in the Museum some time ago by Dr. Morris, and differs considerably from the last of the before-mentioned species, although resembling it in several important particulars, viz., the low crest and smooth ventral scales.

HOLOTROPIS VITTATUS, nob.

Char. Crest low, as in *Microlophus*, much more developed upon the tail; ventral scales smooth; nasal plate quite different in shape from that represented in the figure of *Microlophus* in de la Sagra, tab. vii., fig. A., (Reptiles.) being almost as broad as long; the nostril is situated immediately at its posterior edge, and not at some distance from it, as represented in the figure above mentioned; the plates upon the head are all *very strongly* carinated; the carinae upon the dorsal scales are not situated in the middle, but a little to one side; the five middle rows of abdominal scales larger than the others.

Coloration. Probably altered by alcohol; crest greenish; ground color dark green, with reflections of bronze: a large black blotch upon each temple; a whitish colored vitta immediately beneath, extending upon the neck; another beginning above and in advance of the shoulder, extending along the sides of the body as far as the thighs; two transverse parallel bands of black across the chin; the interspaces and under parts of jaw whitish; throat greenish; abdomen, under parts of extremities and tail of a much lighter color than upon the back.

Dimensions. Length of head 1 inch, greatest breadth 9 lines; length of neck and body 2 inches 9 lines; of tail 4 inches 4 lines; total length 8 inches 1 line.

Habitat. Cuba. One specimen in Mus. Acad., deposited by Dr. Morris.

Ord. OPHIDIA.

Gen. *TROPIDONOTUS*, Kuhl.

Char. "Jaws long, teeth of the upper forming a continuous longitudinal series, although the last or posterior are generally stronger and longer by nearly one-half, and never channelled; scales of the back, and more often those of the sides, presenting a salient line or sort of carina; tail of moderate length."—Duméril and Bibron, T. vii., p. 549.

The *Tropidonotes* belong, in the arrangement of Duméril and Bibron, to the second section or sub-order of Ophidians, viz., the Aglyphodont or Azimiophid serpents, which are characterized as having recurved, conical, rounded, full and smooth teeth, without canulation at their points, and implanted in both jaws.—T. ii. p. 19. Twenty species are described by them, existing in Europe as far north as Norway, N. Africa, Greece, N. America, Seychelles, Java, borders of the Caspian Sea, E. Indies, Japan, Manilla, N. Guinea and Australia. The greater number appear to inhabit N. America. It is very remarkable that, although so numerous in the U. States, they should not be found in the Southern portion of the American continent.

TROPIDONOTUS ANNULARIS, nob.

Char. Nostrils between two plates; internasals long and narrow; a frenal; one antocular, three postocular plates; eight superior labials, the eye resting on

the fourth; præanal scute bifid; scales very distinctly carinated, except the three inferior rows, which are smooth; color above ash; beneath yellow, with transverse dark colored blotches, arranged for the most part alternately, extending upon the sides; these blotches extend about half way across the abdomen; the broadest occupy two scales, the most narrow usually but one, and occasionally unite in the middle; 19 rows of scales; 159 abdom. scuta; 33 bifid sub-caudal.

Dimensions.—Total length 2 ft. 6½ inches, (Fr.) length of tail 3 in. 8 lines.

Habitat.—Ningpo, China. One specimen, in excellent preservation, in Mus. Acad., presented by Dr. McCartee.

Gen. CORONELLA.

The genus *Coronella*, established by Laurenti in 1768, is placed by Duméril and Bibron with the *Tropidonotes* in the family of *Syncrateriens*, having "all the teeth smooth, distributed in the same line, but with the last longer, without a free interspace in front of them." T. vii. p. 525. The genus is thus characterized:

"Serpents with superior maxillary teeth longer and upon the same line with the others, without interval; trunk elongated; tail moderate; scales smooth; snout rounded and a little elongated." Dum. et Bib., tom. vii. p. 607.

Seven species only are described by them, which inhabit Central and Southern Europe, Cape of Good Hope, (cana.) U. States, (getulus, Sayi, dolata, Californica.) To these may be added one formerly described by me from W. Africa, (Proc. Acad. Nat. Sci.,) *C. triangularis*, and the present species from China. Others will no doubt be determined hereafter.

CORONELLA STRIATA, nob.

Char. Head short and thick, rostral plate large and slightly prominent, more extended transversely; internasals two in number, somewhat quadrangular, smaller than prefrontals; prefrontals large and quadrangular, frontal broad and short; occipitals large; nostrils between two plates, a long quadrangular plate reaching from the posterior nasal to the eye, with a small quadrangular plate above it, between the eye and the prefrontal; two posterior orbitals; eight superior labials, the four first narrow, the remainder broad, with the inferior margin of the orbit formed by the fourth and fifth; scales smooth and quadrangular, 17 rows; body long and robust; head thicker than neck; tail of moderate length, pointed.

Coloration. Head brown above, the margins of the plates edged with white; jaws and throat white; a brown blotch behind the eye extending to near the commissure of the mouth; a broader one upon the occiput bordered posteriorly with white; behind the white stripe on either side, which commences near the posterior extremity of the occipital plate, a large brown blotch; upon the back a row of 47 quadrate brown blotches, the interspaces white; sides spotted with brown; abdomen straw color, immaculate; thirteen blotches upon the tail extending upon the sides, with intervening white bands as upon the body; under part of tail brown spotted.

Abdom. scuta 193; præanal single; subcaudal 70.

Dimensions. Length of head 1 inch 6 lines, greatest breadth 1 inch, (Fr.) length of body 2 feet 11½ inches; greatest circumference 3 inches 3 lines; length of tail 8 inches. Total length 3 feet ten lines; greatest circumference 3 inches 3 lines.

Habitat. Ningpo, China. Two specimens in Mus. Acad., presented by Dr. McCartee, one fully grown, another younger, and the head and neck of a third. In one of these specimens there is a distinct anterior orbital plate, with a long quadrangular loreal between it and the posterior nasal.

CROTALIDÆ.

We have also two specimens of *Trigonocephali* from Ningpo, China, presented by Dr. McCartee, which correspond with the description of Duméril and Bibron,

and Siebold and Schlegel's excellent drawing of *Trigonocephalus Blomhoffii*, and are no doubt the same. 141 abdom. sc.; 39 subcaudal; 21 rows of scales, (25, according to Schlegel.) Total length of one specimen 1 foot 4½ inches. (Fr.) length of tail 1 inch 7 lines; length of another specimen 1 foot 7 inches; of tail 2 inches 4 lines. The tail, therefore, appears to be somewhat shorter than is indicated by the description of Professors Duméril and Schlegel, who make it one-sixth of the whole length of the animal. They state that the *Trigonocephalus Blomhoffii* is the only venomous serpent found in Japan.

RANIDÆ.

Among the reptiles recently sent to the Academy by M. Duchailu, are four fine specimens of *Chamæleo dilepis*, and a large serpent formerly described by me in the Proceedings of the Acad. N. S., Vol. vi. p. 205, (*Dendrophis flavigularis*.) The only reptiles in the collection of M. Duchailu that are not new, are four frogs, all belonging to the same species. Two of this family are already known to the collection, viz., *Rana Bibronii*, nob. (abundant,) and *Hyla punctata*, of which we have but one specimen.

RANA ALBOLABRIS, nob.

Char. Head triangular, depressed above; snout slightly rounded; eyes prominent; nostrils latero-superior, two lines apart; openings for the internal nares small and subcircular; between them two converging lines of vomerine teeth; eustachian foramina larger than the openings of the internal nares; tongue obcordate, attached in front, free at the sides, notched posteriorly; back more or less granulated; a raised and well marked lateral fold on each side, extending from the posterior margin of the eye to the extremity of the coccyx; tympanum circular, of moderate size, fingers free; subarticular tubercles distinct; base of toe much swollen; toe and first finger of equal length, third about a line longer than the fourth; anterior extremities moderately robust; posterior also webbed, extending to the distal extremity of the antepenultimate phalanx in all the toes except the fourth, in which it extends to the proximal extremity of the same phalanx; subarticular tubercles of toes less developed than those of fingers.

Coloration. Dark brown above, with obscure transverse bars of a deeper color upon posterior extremities; anterior extremities blotched with darker brown; a white stripe extending from the extremity of the snout, beneath the eye, and tympanum as far as the anterior extremity; a small white spot above the shoulder, which appears to be constant, and in several of the specimens a row of smaller white spots along the sides irregularly disposed. In two of the specimens the back presents a marked tinge of olive; the brown upon the side of the head is somewhat deeper than upon the back, resembling in this respect the *Rana sylvatica*, Le Conte, of which indeed it may be considered the representative in West Africa. Under parts whitish, more or less mingled with brown; in some specimens the brown very greatly predominates; under surface of thighs more or less spotted with brown.

Dimensions. Length of head 9 lines, greatest breadth 8 lines; length of head, neck and body 1 inch 10 lines to 2 inches 1 line; length of posterior extremities 3 inches 2 lines; of anterior 1 inch 3 lines; length of longest toe 9 lines; of longest finger 5½.

Habitus. W. Africa. Four specimens presented by M. Duchailu.

On several new species of Reptiles in the Collection of the Academy of Natural Sciences.

By EDW. HALLOWELL, M. D.

More detailed descriptions, with drawings of several of the species, will be published in the forthcoming volume of the Transactions of the Philosophical Society.

SCINCIDÆ.

Gen. PLESTIODON.

PLESTIODON SINENSE ? Duméril and Bibron.

Char.—Head cuneiform, slightly swollen at the temples; nostrils lateral, opening in a single plate; two supero-nasals, broad and contiguous; an internasal, quadrangular, posterior angle acute, enclosed by the fronto-nasals; (in one specimen the fronto-nasal and internasals are all fused into one plate;) a frontal-hexagonal, broader in front; two fronto-parietals; one inter-parietal; two parietals; no occipital; a freno-nasal; a large and broad frenal; two freno-orbital plates; seven superior labials; nostrils pyriform, broader end above, three or four scales upon its anterior border; third and fourth fingers of equal length; body robust; scales hexagonal, 24 rows; tail long and tapering, robust and cyclo-tetragonal at base; posterior extremities much shorter than anterior; second toe much the longest, with 14 distinct transverse scales; palms of anterior and lobes of posterior extremities tuberculated; six præanal scales, the two middle ones quite large; pterygoid teeth; tongue slightly notched in front, broad and deeply notched posteriorly, squamiform posteriorly.

Color. Olive above, with four dark colored and more or less interrupted bands upon the back and tail, the black spots forming these bands, which are not very distinct, occupying the posterior half of each scale; in some specimens they are much larger than in others; posterior part of scales upon sides marked with black.

Dimensions. Length of head 10 lines, greatest breadth $6\frac{1}{2}$; length of neck, body and vent 3 inch, (Fr.) of tail 4 inches 6 lines. Total length 8 inches 3 lines. Circumference of body 2 inches 2 lines; of tail at base 1 inch 7 lines. Another specimen measured 9 inches in length, and the circumference of the apparently older one was 2 inches 8 lines.

Habitat. Ningpo, China. Five specimens presented by B. H. McCartee, M.D. Nothing is known of its habits.

Gen. Remarks. This animal is very probably the *Plestiodon sinense* of Duméril and Bibron, *Tiliqua rubriventris*, Gray, (Hardwicke's Illustrations of Indian Zoology,) the descriptions of the scales corresponding, viz., olive bordered with yellow, but they make no mention of the four dotted lines down the back, which, however, are shown in Gray's figure, and they give one more row of scales, viz., 25. We have one specimen from the same locality with three white lines down the back bordered with black, probably the young of the above, and which is perhaps identical with *Plestiodon pulchrum*, Duméril and Bibron or *Tiliqua trivittata*, Gray.

Gen. EUPREPIS.

EUPREPIS SURINAMENSIS, nob.

Char. Nostrils in a single plate, near its posterior border; two supero-nasals contiguous; a large and broad internasal, its lateral and inferior margin in contact with the first frenal; two fronto-nasals not contiguous; a frontal more extended in the longitudinal direction, broader in front; two fronto-parietals; a short inter-parietal; two parietals; no occipital; a small naso-frenal; two frenals and two freno-orbital plates; seven superior labials; four supraciliary plates; a transparent disk to the inferior eyelid; 30 rows of scales, those upon back tricarinate; carinæ indistinct; of the præanal scales the two middle the largest.

Color. Olive above, with brown spots, arranged into two longitudinal rows; a brown band on each side from one and a half to two lines in breadth, commencing behind the eye and passing over the ear, losing itself upon the tail; extremities blotched with brown above; under parts silvery white without spots. Total length 7 inches 3 lines.

Habitat. Surinam. One specimen presented by Dr. Hering.

EUPREPIS MICROCEPHALUS, nob.

Syn. *Scincus ventralis*, Peale and Green.

Char. Nostrils in a single plate near its posterior border; two supero-nasals not contiguous; an internasal broader than long, its lateral inferior margin in contact with the first frenal; two fronto-nasals; a frontal very large, broader anteriorly; a small inter-parietal; two parietals, broad and rather short; six superior labials; head short and rather trapu; gape of mouth small; tongue slightly notched in front, papillous; auditory opening somewhat triangular in shape, with three small scales in front; 29 rows of scales, with from 7 to 8 carinæ, the middle ones wider apart than the others; tail longer than head, neck and body, cyclo-totragonal at base, tapering gradually to a point. Total length 4 inches 9 lines.

Habitat. Mexico. One specimen presented by Mr. W. H. Keating.

EUPREPIS DISSIMILIS, nob.

Char. Nostrils in a single plate, near its posterior border; two supero-nasals, slender, contiguous; an internasal, broader than long; two fronto-nasals; a frontal, much more narrow posteriorly; two fronto parietals, longer and more narrow than the fronto-nasals; a short inter-parietal, broader in front; two parietals; a small naso-frenal; two frenals and two freno-orbitars; seven superior labials; a transparent disk to the inferior eyelid; 33 rows of carinated scales, the seven lateral rows more or less *tri-carinate*, the intermediate ones *strongly bi-carinate*; tail long and tapering, cyclo-tetragonal at base.

Color. Light olive above, with three distinct lighter colored vittæ, commencing behind the occiput and extending down the back upon the tail; under parts white without spots. Total length 7 inches 11 lines.

Habitat. Bengal. Two specimens presented by Dr. Burrough.

EUPREPIS LONGICAUDATA, nob.

Char. Nostrils in a single plate, near its posterior border; two slender supero-nasals apparently contiguous; a large internasal extending laterally upon the sides of the head, where it joins the supero-nasal and the first frenal plate; two fronto-nasals, more or less quadrangular, passing likewise down upon the sides of the head, where they join the first and second frenal; a frontal much longer than broad, narrow behind; fronto-parietals pentangular; one inter-parietal, more narrow posteriorly, and two parietals, larger than the fronto-parietals; no occipital; a small naso-frenal; two frenals and two freno-orbitars; seven superior labials; a transparent disk to the inferior eyelid; 30 rows of scales; those upon back distinctly *tri-carinate*, those upon sides also *tri-carinate*, but the carinæ are very indistinct; four inferior rows upon sides, and those upon neck smooth; scales upon tail *tri-carinate*, smooth laterally and inferiorly; tail *very long*.

Color. Olive green above, with a tinge of green below, except upon posterior half of tail, which as well as the upper part is brown; a broad black lateral band on each side.

Total length 8 inches 4½ lines.

Habitat. Siam. One specimen in Museum of Academy, presented by Dr. Ruschenberger, U. S. N.

OPHIOPHTHALMIDÆ.

We have fourteen specimens of *Ablepharus Peronii*. The predominating color in most of these specimens is bronze, mingled with green, with two lateral rays bordered with black, as described by Duméril and Bibron. In some of the specimens, however, the predominating color is brownish above, with two central rows of black spots. Duméril and Bibron observe that this species has a very wide range, being found, according to them, in New Holland, Otaheite, Java, the Isle of France, Morea and Peru.

The entire number of species of Scincoidians or Lepidosaurian Lizards is 100 ;

These birds are very common in the low-lying areas of the coast, and are often seen in the mangrove swamps. They are very tame and will approach the observer very closely. The male has a black head and neck, and a black breast band. The female has a black head and neck, and a black breast band. The young are black above and white below.

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Dimensions. Total length of male 5 1/2 inches, wings 3 1/2, tail 2 1/2, bill 1/2 inch.

Dimensions of some species of Bitter Birds in the Yucatan of the Island of Yucatan.

Remarks of Bitter Birds in the Yucatan of the Island of Yucatan.

By J. J. J. J.

THE BIRD

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Dimensions. Total length of male 5 1/2 inches, wings 3 1/2, tail 2 1/2, bill 1/2 inch.

Colors. Head above dark cinereous, every feather nearly black in the middle; back, rump, upper tail coverts and wing coverts with every feather brownish black in the middle and edged on both sides with golden yellow. Quills brownish black, edged externally with the yellow of the back; narrow on the primaries, wider on the secondaries. Feathers of the throat white at base, dark at their tips. Small space on the abdomen and flanks white, with longitudinal stripes of dark ashy brown. Other under parts and sides of the head and neck clear dark cinereous, under tail coverts slightly edged with white. Under wing coverts ashy. Tail, with the four central feathers brownish black, narrowly edged with

yellow, others yellowish white, tipped with dark brown. Bill and feet bluish black.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—As stated above, this species is about the size of *I. minor*, and somewhat resembles it. In addition to the differences already pointed out, this bird has the bill entirely bluish black, not white at base of the under mandible as in *I. minor*, and as carefully represented in Temm. Pl. Col. 542. The colors are much more clear and different from that species. The bill in the present bird is remarkably short and thick.

This species may be that represented by Le Vaillant, Ois. d'Afrique, pl. 242, but is very different from that represented in Cimelia Physica, pl. 24, A. The latter is *I. Sparrmanni*, Stephens, but not the former. It is possible, too, that this may be the bird alluded to by authors on the Ornithology of Western Africa as *I. minor*, but it is distinct from that species of Southern Africa.

2. MELIGNOTHES EXILIS, nobis.

The smallest of all known birds of this group. Bill short, thick; wings moderate; second and third quills slightly longest; tail moderate; legs and toes rather strong.

Dimensions.—Total length (of skin) $4\frac{1}{2}$ inches, wings $2\frac{1}{2}$, tail $1\frac{1}{2}$ inches.

Entire upper plumage with every feather dark in the middle and edged on both sides with greenish yellow, darker on the head. Quills dark brown, edged externally with yellow. Entire under parts greenish cinereous, paler on the abdomen and nearly white on the ventral region. Tail with the four middle feathers brownish black, others yellowish white tipped with dark brown. Bill bluish black; base of under mandible yellowish white; feet bluish black.

Hab.—River Moonda, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—This is the smallest *Indicator* yet discovered, and is a singular looking little bird. The bill is short and thick, almost resembling that of some species of *Euphonia*. This bird, in general appearance, bears some resemblance to the preceding, but is much smaller and easily distinguished. One specimen only is in the collection.

GENUS HETÆRODES, nobis.

Allied to typical *Indicator*. Bill moderate, curved, slender, rather wide at base, but rather abruptly compressed and tapering to the point; wings rather long; second and third quills longest and nearly equal; tail moderate, containing ten rather wide feathers; tarsi and toes weak, slender, the two anterior rather long. Size of only known species small.

3. HETÆRODES INSIGNIS, nobis.

Small, about the size of the last preceding and resembling it in color, but with the bill totally different (as above described), and the feet smaller and slender.

Dimensions.—Total length (of skin) $4\frac{1}{2}$ inches, wing $2\frac{1}{2}$, tail $1\frac{1}{2}$ inches.

Colors.—Entire upper parts dark olive, tinged with yellow, the latter prevailing on the lower back and rump; quills dark brown, edged externally with greenish yellow; narrow on the primaries, wider on the secondaries, and internally with yellowish white. Under parts ashy olive, darker on the breast, paler and nearly white on the abdomen and under tail coverts. Under wing coverts yellowish white. Tail with the four middle feathers dark olive brown, outer feathers yellowish white, edged with pure yellow. Bill and feet bluish black.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—This is one of the most curious little birds that I have ever seen. It is in all respects, a miniature cuckoo, having evident alliance to *Indicator* and to *Chrysococcyx*, but especially to the former. The bill is pointed and curved somewhat as in the larger species of *Indicator*, but more slender. The plumage, and especially the tail are of the same colors that prevail in this group. One specimen only is in the present collection.

4. *ISPIDINA LECONTEI*, nobis.

The smallest of the birds of the genera *Ispidina* and *Corythornis*, and with the bill broader and more flat. Bill long, broad, flat, rather obtuse at the point; wing moderate, third quill slightly longest; tail very short; legs short, weak.

Dimensions.—Total length (of skin) $3\frac{1}{4}$ inches, wing 1 8-10ths, tail 9-10ths, bill in front 1, width of bill at nostrils 3-10ths inch.

Colors.—Male. Front black (without spots), crown and occiput bluish black, with small spots of light blue; back, rump and upper tail coverts light blue, with a purple tinge, a narrow partially concealed collar of rufous on the neck behind; wing coverts black, with small purplish blue spots, quills bluish black, edged with pale rufous on their inner webs. Tail bluish black. A small spot in front of the eye; cheeks, breast and abdomen yellowish rufous, darker on the breast, throat white, under wing coverts rufous. Upper mandible brownish black, point white; under mandible at base yellow, then dark brown towards the point, but at the point white; legs yellow.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

This little bird may readily be distinguished from either of the species of minute kingfishers of the genera *Ispidina* and *Corythornis*, previously known by its much broader and flat bill, which is long and quite as flat as in any species of *Todiramphus*. The frontal feathers are clear, lustrous black to the base of the upper mandible, unspotted. It is, moreover, the smallest of all those species.

Of the two genera mentioned, all the known species are now in the collection of this Academy, including *Ispidina nitida*, Kaup., and *Corythornis nais*, Kaup. The present is the only specimen that I have ever seen of this species, and is not readily to be mistaken for any other.

This curious little species is named in honor of my friend John L. Leconte, M. D., one of the most distinguished and accomplished of American Zoologists with whom I have had the great gratification of intimate and uninterrupted friendship for years.

5. *NAPOThERA CASTANEA*, nobis.

About the size of *N. atricapilla* of Sumatra, and somewhat resembles it. Bill moderate, straight, rather wide at base, distinctly notched, curved abruptly at tip, wing rather long, fourth quill longest. Tail moderate, ample, somewhat rounded.

Dimensions.—Total length (of skin) $6\frac{1}{2}$ inches, wing 3 4-10ths, tail $2\frac{1}{2}$ inches.

Colors.—Male. Feathers of the forehead and over the eye black, each having a middle longitudinal line of bright rufous. Feathers of the crown and occiput at base light reddish yellow and tipped with dark rufous. Back, wing coverts and rump bright reddish chestnut, darker on the rump. Lores, cheeks, sides and flanks light cinereous. Throat, middle of breast and abdomen white. Under tail coverts yellowish white. Bill brownish black, feet lighter. Greater wing coverts with light rufous circular spots at their tips, edged with black.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

This bird is, for all that I can see, an aberrant *Napothera*, and in its general appearance resembles *N. atricapilla*, *coronata*, and other species of Sumatra, Borneo and Java. It appears to be the first species of this genus yet discovered in Western Africa.

6. *TRICOPHORUS CALURUS*, nobis.

General form of and resembling *T. gularis*, Horsfield, (not Swainson,) and *T. caniceps*, both of Java and Borneo, and about the size of the latter, but smaller than the former. Bill slightly curved; fifth quill longest. Tail rather long.

Dimensions.—Total length (of skin) about 7 inches, wing $3\frac{1}{2}$, tail $3\frac{1}{4}$ inches.

Colors.—Male. Throat white. Tail and its upper coverts rufous, the outer feathers edged narrowly with greenish yellow; tail beneath lighter.

Head above dark brownish ashy, cheeks lighter, each feather with a line of white, a narrow ring of ashy white around the eye. Back, rump and wings yellowish olive green, rather darkest on the wings. Under parts (except throat) greenish yellow, or nearly pure yellow in the middle of the breast and abdomen,

and much shaded with green on the sides. Under coverts of the wings greenish yellow. Bill corneous, the margins white, tarsi light bluish.

Female similar but smaller.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—This species much resembles in form and color *T. gularis*, Horsfield, from Java, but is much smaller and otherwise different. It also resembles *T. caniceps*, Lafres, (which seems to be *Napothera sulphurata*, Müller,) and is about the same size. It is a very remarkable form for Western Africa.

In color this bird appears to be similar to *Dasycephala syndactyla*, Swainson, (which is described as $9\frac{1}{2}$ inches long,) but it has no *syndactyle* character, and is much smaller. Several specimens are in the collection.

7. *TRICOPHORUS NOTATUS*, nobis.

Bill moderate, nearly straight; wing with the fourth and fifth quills longest. Tail rather long.

Dimensions.—Total length (of skin) about $7\frac{1}{2}$ inches, wing $3\frac{1}{2}$, tail $3\frac{1}{2}$ inches.

Colors.—Male. A spot of yellow in front of the eye. Entire upper parts yellowish olive green, darker on the head; wings and tail the same color as the back, with the inner webs of the feathers dark reddish brown. Quills edged on their inner webs with pale yellow, outer feathers of the tail with large spots of pale yellow at their tips. Under parts bright yellow, tinged with green on the sides. Bill corneous, edges of both mandibles white; tarsi light colored. Under wing coverts yellow. Female, similar but rather smaller.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—Owing to evident difficulties in determining the species of birds which have been referred to the genus *Tricophorus*, we have invariably declined presenting any as new in the various African collections that have come into our hands. But the two birds that we now describe are so strongly marked, that we have abandoned our previous custom.

The present bird belongs to the same group as *T. canicapillus*, Hartlaub, characterized in some measure by the bill being straighter than usual in this genus. It does not, however, closely resemble that species, nor any other known to us, and is strongly marked by the bright yellow spot in front of the eye, which character distinguishes it at once from *T. eximius*, Hartlaub (Cabanis Journal, 1855. p. 356), and it is much smaller. Four specimens are in the collection.

On motion of Dr. Rand, the Academy proceeded to an election for Librarian to fill the vacancy caused by the resignation of Dr. W. S. Zantzinger.

The Chair appointed Dr. Brinton and Mr. Schafhirt, Tellers. The election having been held, the tellers reported that Dr. J. Aitken Meigs had been unanimously elected.

ELECTION.

Drs. Wm. Mayburry, Thos. George Morton, and George R. Morehouse, of Philadelphia, and Mr. Alfred Monnier, of Camden, were elected Members; and Mr. J. Barnard Davis, of Shelton, England, was elected a Correspondent of the Academy.





September 2d, 1856.

MR. LEA, Vice President, in the Chair.

Letters were read—

From the Canadian Institute, dated Toronto, C. W., July 25th, 1856, transmitting the Canadian Journal for 1856, and desiring exchange. Referred to the Committee on Proceedings.

From F. V. Hayden, dated Fort Union, July 10th, 1856, acknowledging his election as Correspondent.

From B. F. Shumard, Secretary of the Academy of Science of St. Louis, dated July 30th, 1856, acknowledging the receipt of copies of the Journal and Proceedings of the Academy, and enclosing a resolution of thanks adopted by the Academy at St. Louis.

From the Boston Society of Natural History, dated June 26th, 1856, acknowledging the receipt of the Proceedings of the Academy, (Vol. 8, No. 1, Title and Index,) and the Journal, (N. S. Vol. 3, part 2.)

From the Librarian of the British Museum, acknowledging the receipt of the Proceedings of the Academy, (Vol. 6, Nos. 7, 12, and Vol. 7, No. 1.)

From F. A. Sauvalle, dated Havana, June 2, 1856, transmitting a collection of shells.

From the Royal Society of Sciences of Liege, dated Bonn, April 20th, 1856, transmitting their Memoirs, acknowledged this evening.

From the Natural History Union of Prussian Rhineland and Westphalia, dated March 24th, 1856, transmitting their publications acknowledged this evening.

Dr. Leidy read a paper entitled, "Notice of some Remains of Extinct Vertebrated Animals, by Joseph Leidy, M. D.," which was referred to a committee consisting of Dr. T. B. Wilson, Dr. Le Conte, and Mr. Haldeman.

Mr. Ashmead stated that, he had observed during the past summer an unusual scarcity of marine algæ at Beesley's Point, some species usually found in shallow waters having entirely disappeared. Mr. A. attributed this to the intense cold of last winter causing the shallow bays and ponds to be frozen to the bottom. When the ice broke up, the seaweed adhering to it would be carried away. Whole beds of planted oysters were thus lost. The *Heterodon Platyrrhynchus*, generally very abundant, was this year almost extinct. Dr. Leidy stated that he had been informed by the fishermen, that immense numbers of crabs were destroyed by the cold, so that this season they were quite scarce. Mr. Haldeman had observed numbers of evergreens killed by the winter's cold.

September 9th.

DR. BRIDGES, Vice President, in the Chair.

A paper was presented entitled, "Researches upon the Cyprinoid Fishes inhabiting the fresh waters of the United States of America, west of the Mississippi Valley, from specimens in the museum of the Smithsonian Institution, by Charles Girard, M. D.," which was referred to a Committee consisting of Drs. J. A. Meigs, Rand, and Hallowell.

September 16th.

MR. LEA, Vice President, in the Chair.

Letters were read—

From the Royal Academy of Sciences of Madrid, dated December 31st, 1854, transmitting their publications acknowledged this evening.

From the Smithsonian Institution, dated Washington, June 18th, 1856, acknowledging the receipt of Vol. 8, No. 2, of the Proceedings of the Academy.

From the American Philosophical Society, dated September 3d, 1856, acknowledging the receipt of the Journal, (N. S. Vol. 3, part 2,) and the Proceedings (Vol. 8, Nos. 1, 2, 3), of the Academy.

Dr. Leidy remarked that, he had observed the eyes of the Katy-did (*Platyphylum concavum*) which during the day are translucent and greenish, at night assume a deep cherry red color. Upon experimenting with the insect he found that, when the light was excluded, in the course of a few hours the eyes gradually became dark red, and after a restoration of light they again became translucent and greenish. The phenomenon was not positively explained, but it was supposed to belong to the same category of changes, observed in the skin of certain reptiles and cephalopods; i. e. the coloring matter of the eyes probably is composed of chromatophora, or contractile pigment cells, which according to the condition of contraction exhibit a difference in color.

Dr. Leidy also directed the attention of the members to several shells of the oyster and clam (*Ostrea virginiana* and *Venus mercenaria*) much perforated, which are common on the ocean shore, where they are noticed by all visitors. Dr. L. had for a long time suspected that the perforations were due to some other molluscous animal or a worm; and he had frequently sought for them. The last summer, in dredging, in company with Mr. Ashmead and Prof. Baird, on an old oyster bed, at Great Egg Harbor, New Jersey, a large number of these perforated shells were obtained, and all of them were observed to be occupied by a sulphur yellow sponge of the genus *Cliona*. This boring sponge forms an extensive system of galleries between the outer and inner layer of the shells, and protrudes through the perforations of the latter tubular processes, from one to two lines long and one-half to three-fourths of a line wide. The tubes are of two kinds; the most numerous being cylindrical and expanded at the orifice in a corolla form, with their margin thin, translucent, entire, veined with more opaque lines, and with the throat bristling with silicious spiculæ. The second kind of tubes are comparatively few, about as one is to thirty of the other, and are shorter, wider, not expanded at the orifice, and the throat unobstructed

with spiculæ. Some of the second variety of tubes are constituted of a confluent pair, the throat of which bifurcates at bottom. Both kinds of the tubes are very slightly contractile, and under irritation may gradually assume the appearance of superficial wart-like eminences within the perforations of the shell occupied by the sponge. Water obtains access to the interior of the latter through the more numerous tubes, and is expelled in quite active currents from the wider tubes.

In structure the sponge is composed of an intertexture of granular matter and pin-like silicious spiculæ. Several species of *Cliona* are indicated by European naturalists, but are not characterised with sufficient detail to determine whether the one above indicated is distinct or not from them.

Dr. L. further added, it might appear only of scientific interest to observe a structure so low as the sponge is classified in the organic kingdom, endowed with the power of penetrating such dense and hard bodies as the shell of the clam and oyster, but he suspected that the agency of the boring sponge was a highly important one in the sequence of natural phenomena, as it is a means by which dead shells are rapidly decomposed to be dissolved in the ocean water, where they may again serve as the elements of construction of the habitations of the rising generations of molluscan animals. In confirmation of this view Dr. L. stated, that an extensive bed of oysters, which had been planted by Mr. Thomas Beasley, at Great Egg Harbor, and which was in excellent condition three years since, had been subsequently destroyed by an accumulation of mud. The shells of the dead oysters, which were of large size and in great number, in the course of two years have been so completely riddled by the boring *Cliona* that they may be crushed with the utmost ease, whereas without the agency of this sponge the dead shells might have remained in their soft, muddy bed, devoid of sand and pebbles, undecomposed perhaps even for a century.

September 23d.

Mr. ORD, President in the Chair.

Mr. Lea presented a paper entitled, "Description of the Byssus in the genus *Unio*, by Isaac Lea," which was referred to a committee consisting of Dr. T. B. Wilson, Dr. Bridges, and Mr. Vaux.

September 30th.

DR. BRIDGES, Vice President, in the Chair.

The Committee on Dr. Leidy's paper read 2d inst., on Dr. Girard's paper read 9th inst., and on Mr. Lea's paper read 23d inst., severally reported in favor of publication in the Proceedings of the Academy.

Notice of some remains of extinct Vertebrated Animals.

By JOSEPH LEIDY, M. D.

1. *LEPTAUCHENIA MAJOR*, Leidy. In an examination of a collection of fossils obtained by Dr. F. V. Hayden, in Nebraska, for the St. Louis Academy of Science, I observed the mutilated jaws of a larger species of *Leptauchenia* than that previously characterized under the name of *L. decora*, (Pr. A. N. S., Phila., viii. 88.) In the upper jaw there are seven molars, forming nearly a continuous row, pre-

SCINCIDÆ.

Gen. PLESTIODON.

PLESTIODON SINENSIS ? Duméril and Bibron.

Char.—Head cuneiform, slightly swollen at the temples; nostrils lateral, opening in a single plate; two superno-nasals, broad and contiguous; an internasal, quadrangular, posterior angle acute, enclosed by the fronto-nasals; (in one specimen the fronto-nasal and internasals are all fused into one plate;) a frontal-hexagonal, broader in front; two fronto-parietals; one inter-parietal; two parietals; no occipital; a freno-nasal; a large and broad frenal; two freno-orbital plates; seven superior labials; nostrils pyriform, broader end above, three or four scales upon its anterior border; third and fourth fingers of equal length; body robust; scales hexagonal, 24 rows; tail long and tapering, robust and cyclo-tetragonal at base; posterior extremities much shorter than anterior; second toe much the longest, with 14 distinct transverse scales; palms of anterior and lobes of posterior extremities tuberculated; six præanal scales, the two middle ones quite large; pterygoid teeth; tongue slightly notched in front, broad and deeply notched posteriorly, squamiform posteriorly.

Color. Olive above, with four dark colored and more or less interrupted bands upon the back and tail, the black spots forming these bands, which are not very distinct, occupying the posterior half of each scale; in some specimens they are much larger than in others; posterior part of scales upon sides marked with black.

Dimensions. Length of head 10 lines, greatest breadth $6\frac{1}{2}$; length of neck, body and vent 3 inch, (Fr.) of tail 4 inches 6 lines. Total length 8 inches 3 lines. Circumference of body 2 inches 2 lines; of tail at base 1 inch 7 lines. Another specimen measured 9 inches in length, and the circumference of the apparently older one was 2 inches 8 lines.

Habitat. Ningpo, China. Five specimens presented by B. H. McCartee, M.D. Nothing is known of its habits.

Gen. Remarks. This animal is very probably the *Plestiodon sinense* of Duméril and Bibron, *Tiliqua rubriventris*, Gray, (Hardwicke's Illustrations of Indian Zoology,) the descriptions of the scales corresponding, viz., olive bordered with yellow, but they make no mention of the four dotted lines down the back, which, however, are shown in Gray's figure, and they give one more row of scales, viz., 25. We have one specimen from the same locality with three white lines down the back bordered with black, probably the young of the above, and which is perhaps identical with *Plestiodon pulchrum*, Duméril and Bibron or *Tiliqua trivittata*, Gray.

Gen. EUPREPIS.

EUPREPIS SURINAMENSIS, nob.

Char. Nostrils in a single plate, near its posterior border; two superno-nasals contiguous; a large and broad internasal, its lateral and inferior margin in contact with the first frenal; two fronto-nasals not contiguous; a frontal more extended in the longitudinal direction, broader in front; two fronto-parietals; a short inter-parietal; two parietals; no occipital; a small naso-frenal; two frenals and two freno-orbital plates; seven superior labials; four supraciliary plates; a transparent disk to the inferior eyelid; 30 rows of scales, those upon back tricarinate; carinæ indistinct; of the præanal scales the two middle the largest.

Color. Olive above, with brown spots, arranged into two longitudinal rows; a brown band on each side from one and a half to two lines in breadth, commencing behind the eye and passing over the ear, losing itself upon the tail; extremities blotched with brown above; under parts silvery white without spots. Total length 7 inches 3 lines.

Habitat. Surinam. One specimen presented by Dr. Hering.

EURYPIS MICROCEPHALUS, nob.

Syn. *Scincus ventralis*, Peale and Green.

Char. Nostrils in a single plate near its posterior border; two supero-nasals not contiguous; an internasal broader than long, its lateral inferior margin in contact with the first frenal; two fronto-nasals: a frontal very large, broader anteriorly; a small inter-parietal; two parietals, broad and rather short; six superior labials; head short and rather trapu; gape of mouth small; tongue slightly notched in front, papillous; auditory opening somewhat triangular in shape, with three small scales in front: 29 rows of scales, with from 7 to 8 carinæ, the middle ones wider apart than the others; tail longer than head, neck and body, cyclo-totragonal at base, tapering gradually to a point. Total length 4 inches 9 lines.

Habitat. Mexico. One specimen presented by Mr. W. H. Keating.

EURYPIS DISSIMILIS, nob.

Char. Nostrils in a single plate, near its posterior border; two supero-nasals, slender, contiguous; an internasal, broader than long; two fronto-nasals; a frontal, much more narrow posteriorly; two fronto parietals, longer and more narrow than the fronto-nasals; a short inter-parietal, broader in front; two parietals; a small naso-frenal; two frenals and two freno-orbitars; seven superior labials; a transparent disk to the inferior eyelid; 33 rows of carinated scales, the seven lateral rows more or less *tri-carinate*, the intermediate ones *strongly bi-carinate*; tail long and tapering, cyclo-tetragonal at base.

Color. Light olive above, with three distinct lighter colored vittæ, commencing behind the occiput and extending down the back upon the tail; under parts white without spots. Total length 7 inches 11 lines.

Habitat. Bengal. Two specimens presented by Dr. Burrough.

EURYPIS LONGICAUDATA, nob.

Char. Nostrils in a single plate, near its posterior border; two slender supero-nasals apparently contiguous; a large internasal extending laterally upon the sides of the head, where it joins the supero-nasal and the first frenal plate; two fronto-nasals, more or less quadrangular, passing likewise down upon the sides of the head, where they join the first and second frenal; a frontal much longer than broad, narrow behind; fronto-parietals pentangular; one inter-parietal, more narrow posteriorly, and two parietals, larger than the fronto-parietals; no occipital; a small naso-frenal; two frenals and two freno-orbitars; seven superior labials; a transparent disk to the inferior eyelid; 30 rows of scales; those upon back distinctly *tri-carinate*, those upon sides also *tri-carinate*, but the carinæ are very indistinct; four inferior rows upon sides, and those upon neck smooth; scales upon tail *tri-carinate*, smooth laterally and inferiorly; tail *very long*.

Color. Olive green above, with a tinge of green below, except upon posterior half of tail, which as well as the upper part is brown; a broad black lateral band on each side.

Total length 8 inches 4½ lines.

Habitat. Siam. One specimen in Museum of Academy, presented by Dr. Ruschenberger, U. S. N.

OPHIOPHTHALMIDÆ.

We have fourteen specimens of *Ablepharus Peronii*. The predominating color in most of these specimens is bronze, mingled with green, with two lateral rays bordered with black, as described by Duméril and Bibron. In some of the specimens, however, the predominating color is brownish above, with two central rows of black spots. Duméril and Bibron observe that this species has a very wide range, being found, according to them, in New Holland, Otaheite, Java, the Isle of France, Morea and Peru.

The entire number of species of *Scincoidian* or *Lepidoaurian Lizards* is 106:

these we have about 40, comprising 132 individuals, with many duplicates of several of the species, twenty-one specimens, for instance, of *Gongylus ocellatus*. They include the following genera, viz., *Scincus*, *Sphenops*, *Gongylus*, *Plesiodon*, *Eumeces*, *Euprepis*, *Lygosoma*, *Tropidolopisma*, *Leiopolisma*, *Cyclodus*, *Trachysaurus*, *Ablepharus*, *Seps*, *Anguis* and *Acontias*.

[Fam. BOIDE.

Gen. NOTOPHIS, nob.

Char. Head small, triangular, depressed above; eyes of moderate size, lateral, supraciliary plates not projecting; anterior half of head covered with well defined plates, posterior with scales; two internasals; two anterior and two posterior frontals, the former passing down alongside of the head to meet the superior labials; nostrils in a single plate; eleven plates upon the top of the head, viz., two internasals, two anterior and two posterior frontals, a vertical and two occipitals, with several small plates between them; a loreal, one anterior orbital and three posterior orbitals; a row of hexagonal scales larger than the others running along the median line of the back; preanal scute and subcaudal plates single; ventral scutes quite narrow.

NOTOPHIS BICARINATUS, nob.

Char. Color uniformly yellow, with a tinge of red upon the abdomen; nine superior labials, the sixth higher than the others; dorsal middle row bicarinate, the rest uni-carinate; carinae quite distinct; 27 rows of scales; 215 longitudinal rows upon body; 41 upon tail.

Dimensions. Total length 1 foot 8½ inches; of tail 2 inches 4 lines, (prehensile.)

Habitat. Cuba. One specimen presented by Gavin Watson, M. D.

Descriptions of new species of African Birds, in the Museum of the Academy of Natural Sciences, of Philadelphia, collected by Mr. P. B. Du Chaillu, in Equatorial Africa.

By JOHN CASSIN.

GENUS MELIGNOTHE, nobis.

Bill short, thick and conical. Wings rather long; second, third and fourth quills longest and nearly equal. Tail moderate. Allied to the genus *Indicator*, Vieillot.

The short billed *Indicators* form a distinct group, easily recognized by the bill, as above described. Heretofore there have been known *Indicator minor*, Stephens, (*I. minimus*, Temm.) and *Indicator xanthonotus*, Blyth, belonging to this group, but in neither of them is the bill so short and thick as in the two species that we are now about to describe.

1. MELIGNOTHE CONIROSTRIS, nobis.

About the size of *I. minor* and resembling it, but with the bill thicker; wings shorter; legs and toes longer. Bill short, thick, wide and rather suddenly compressed at the tip; nostrils large; third and fourth quills slightly longest. Legs stout; toes long; tail moderate, rounded.

Dimensions.—Total length (of skin) 5½ inches, wings 3½, tail 2½, bill ½ inch.

Colors.—Head above dark cinereous, every feather nearly black in the middle; back, rump, upper tail coverts and wing coverts with every feather brownish black in the middle and edged on both sides with golden yellow. Quills brownish black, edged externally with the yellow of the back; narrow on the primaries, wider on the secondaries. Feathers of the throat white at base, dark at their tips. Small space on the abdomen and flanks white, with longitudinal stripes of dark ashy brown. Other under parts and sides of the head and neck clear dark cinereous, under tail coverts slightly edged with white. Under wing coverts ashy. Tail, with the four central feathers brownish black, narrowly edged with

yellow, others yellowish white, tipped with dark brown. Bill and feet bluish black.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—As stated above, this species is about the size of *I. minor*, and somewhat resembles it. In addition to the differences already pointed out, this bird has the bill entirely bluish black, not white at base of the under mandible as in *I. minor*, and as carefully represented in Temm. Pl. Col. 542. The colors are much more clear and different from that species. The bill in the present bird is remarkably short and thick.

This species may be that represented by Le Vaillant, Ois. d'Afrique, pl. 242, but is very different from that represented in Cinclia Physica, pl. 24, A. The latter is *I. Sparrmanni*, Stephens, but not the former. It is possible, too, that this may be the bird alluded to by authors on the Ornithology of Western Africa as *I. minor*, but it is distinct from that species of Southern Africa.

2. *MELIGNOTHES EXILIS*, nobis.

The smallest of all known birds of this group. Bill short, thick; wings moderate; second and third quills slightly longest; tail moderate; legs and toes rather strong.

Dimensions.—Total length (of skin) 4½ inches, wings 2½, tail 1½ inches.

Entire upper plumage with every feather dark in the middle and edged on both sides with greenish yellow, darker on the head. Quills dark brown, edged externally with yellow. Entire under parts greenish cinereous, paler on the abdomen and nearly white on the ventral region. Tail with the four middle feathers brownish black, others yellowish white tipped with dark brown. Bill bluish black; base of under mandible yellowish white; feet bluish black.

Hab.—River Moonda, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—This is the smallest *Indicator* yet discovered, and is a singular looking little bird. The bill is short and thick, almost resembling that of some species of *Euphonia*. This bird, in general appearance, bears some resemblance to the preceding, but is much smaller and easily distinguished. One specimen only is in the collection.

GENUS *HETERODES*, nobis.

Allied to typical *Indicator*. Bill moderate, curved, slender, rather wide at base, but rather abruptly compressed and tapering to the point; wings rather long; second and third quills longest and nearly equal; tail moderate, containing ten rather wide feathers; tarsi and toes weak, slender, the two anterior rather long. Size of only known species small.

3. *HETERODES INIGNIA*, nobis.

Small, about the size of the last preceding and resembling it in color, but with the bill totally different (as above described), and the feet smaller and slender.

Dimensions.—Total length (of skin) 4½ inches, wing 2½, tail 1½ inches.

Colors.—Entire upper parts dark olive, tinged with yellow, the latter prevailing on the lower back and rump; quills dark brown, edged externally with greenish yellow; narrow on the primaries, wider on the secondaries, and internally with yellowish white. Under parts ashy olive, darker on the breast, paler and nearly white on the abdomen and under tail coverts. Under wing coverts yellowish white. Tail with the four middle feathers dark olive brown, outer feathers yellowish white, edged with pure yellow. Bill and feet bluish black.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—This is one of the most curious little birds that I have ever seen. It is in all respects, a miniature cuckoo, having evident alliance to *Indicator* and to *Chrysococcyx*, but especially to the former. The bill is pointed and curved somewhat as in the larger species of *Indicator*, but more slender. The plumage, and especially the tail are of the same colors that prevail in this group. One specimen only is in the present collection.

4. *ISPIDINA LECONTEI*, nobis.

The smallest of the birds of the genera *Ispidina* and *Corythornis*, and with the bill broader and more flat. Bill long, broad, flat, rather obtuse at the point; wing moderate, third quill slightly longest; tail very short; legs short, weak.

Dimensions.—Total length (of skin) $3\frac{1}{2}$ inches, wing 1 8-10ths, tail 9-10ths, bill in front 1, width of bill at nostrils 3-10ths inch.

Colors.—Male. Front black (without spots), crown and occiput bluish black, with small spots of light blue; back, rump and upper tail coverts light blue, with a purple tinge, a narrow partially concealed collar of rufous on the neck behind; wing coverts black, with small purplish blue spots, quills bluish black, edged with pale rufous on their inner webs. Tail bluish black. A small spot in front of the eye; cheeks, breast and abdomen yellowish rufous, darker on the breast, throat white, under wing coverts rufous. Upper mandible brownish black, point white; under mandible at base yellow, then dark brown towards the point, but at the point white; legs yellow.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

This little bird may readily be distinguished from either of the species of minute kingfishers of the genera *Ispidina* and *Corythornis*, previously known by its much broader and flat bill, which is long and quite as flat as in any species of *Todiramphus*. The frontal feathers are clear, lustrous black to the base of the upper mandible, unspotted. It is, moreover, the smallest of all those species.

Of the two genera mentioned, all the known species are now in the collection of this Academy, including *Ispidina nitida*, Kaup., and *Corythornis nais*, Kaup. The present is the only specimen that I have ever seen of this species, and is not readily to be mistaken for any other.

This curious little species is named in honor of my friend John L. Leconte, M. D., one of the most distinguished and accomplished of American Zoologists with whom I have had the great gratification of intimate and uninterrupted friendship for years.

5. *NAPOTHERA CASTANEA*, nobis.

About the size of *N. atricapilla* of Sumatra, and somewhat resembles it. Bill moderate, straight, rather wide at base, distinctly notched, curved abruptly at tip, wing rather long, fourth quill longest. Tail moderate, ample, somewhat rounded.

Dimensions.—Total length (of skin) $6\frac{1}{2}$ inches, wing 3 4-10ths, tail $2\frac{1}{2}$ inches.

Colors.—Male. Feathers of the forehead and over the eye black, each having a middle longitudinal line of bright rufous. Feathers of the crown and occiput at base light reddish yellow and tipped with dark rufous. Back, wing coverts and rump bright reddish chestnut, darker on the rump. Lores, cheeks, sides and flanks light cinereous. Throat, middle of breast and abdomen white. Under tail coverts yellowish white. Bill brownish black, feet lighter. Greater wing coverts with light rufous circular spots at their tips, edged with black.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

This bird is, for all that I can see, an aberrant *Napothera*, and in its general appearance resembles *N. atricapilla*, *coronata*, and other species of Sumatra, Borneo and Java. It appears to be the first species of this genus yet discovered in Western Africa.

6. *TRICOPHORUS CALURUS*, nobis.

General form of and resembling *T. gularis*, Horsfield, (not Swainson,) and *T. caniceps*, both of Java and Borneo, and about the size of the latter, but smaller than the former. Bill slightly curved; fifth quill longest. Tail rather long.

Dimensions.—Total length (of skin) about 7 inches, wing $3\frac{1}{2}$, tail $3\frac{1}{2}$ inches.

Colors.—Male. Throat white. Tail and its upper coverts rufous, the outer feathers edged narrowly with greenish yellow; tail beneath lighter.

Head above dark brownish ashy, cheeks lighter, each feather with a line of white, a narrow ring of ashy white around the eye. Back, rump and wings yellowish olive green, rather darkest on the wings. Under parts (except throat) greenish yellow, or nearly pure yellow in the middle of the breast and abdomen,

and much shaded with green on the sides. Under coverts of the wings greenish yellow. Bill corneous, the margins white, tarsi light bluish.

Female similar but smaller.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—This species much resembles in form and color *T. gularis*, Horsfield, from Java, but is much smaller and otherwise different. It also resembles *T. caniceps*, Lafres, (which seems to be *Napothera sulphurata*, Muller,) and is about the same size. It is a very remarkable form for Western Africa.

In color this bird appears to be similar to *Dasycephala syndactyla*, Swainson, (which is described as $9\frac{1}{2}$ inches long,) but it has no *syndactyle* character, and is much smaller. Several specimens are in the collection.

7. *TRICOPHORUS NOTATUS*, nobis.

Bill moderate, nearly straight; wing with the fourth and fifth quills longest. Tail rather long.

Dimensions.—Total length (of skin) about $7\frac{1}{2}$ inches, wing $3\frac{1}{2}$, tail $3\frac{1}{2}$ inches.

Colors.—Male. A spot of yellow in front of the eye. Entire upper parts yellowish olive green, darker on the head; wings and tail the same color as the back, with the inner webs of the feathers dark reddish brown. Quills edged on their inner webs with pale yellow, outer feathers of the tail with large spots of pale yellow at their tips. Under parts bright yellow, tinged with green on the sides. Bill corneous, edges of both mandibles white; tarsi light colored. Under wing coverts yellow. Female, similar but rather smaller.

Hab.—Moonda river, Western Africa. Discovered by Mr. P. B. Du Chaillu.

Obs.—Owing to evident difficulties in determining the species of birds which have been referred to the genus *Tricophorus*, we have invariably declined presenting any as new in the various African collections that have come into our hands. But the two birds that we now describe are so strongly marked, that we have abandoned our previous custom.

The present bird belongs to the same group as *T. canicapillus*, Hartlaub, characterized in some measure by the bill being straighter than usual in this genus. It does not, however, closely resemble that species, nor any other known to us, and is strongly marked by the bright yellow spot in front of the eye, which character distinguishes it at once from *T. eximius*, Hartlaub (Cabanis Journal, 1855, p. 356), and it is much smaller. Four specimens are in the collection.

On motion of Dr. Rand, the Academy proceeded to an election for Librarian to fill the vacancy caused by the resignation of Dr. W. S. Zantzinger.

The Chair appointed Dr. Brinton and Mr. Schafhirt, Tellers. The election having been held, the tellers reported that Dr. J. Aitken Meigs had been unanimously elected.

ELECTION.

Drs. Wm. Mayburry, Thos. George Morton, and George R. Morehouse, of Philadelphia, and Mr. Alfred Monnier, of Camden, were elected Members; and Mr. J. Barnard Davis, of Shelton, England, was elected a Correspondent of the Academy.

September 2d, 1856.

MR. LEA, Vice President, in the Chair.

Letters were read—

From the Canadian Institute, dated Toronto, C. W., July 25th, 1856, transmitting the Canadian Journal for 1856, and desiring exchange. Referred to the Committee on Proceedings.

From F. V. Hayden, dated Fort Union, July 10th, 1856, acknowledging his election as Correspondent.

From B. F. Shumard, Secretary of the Academy of Science of St. Louis, dated July 30th, 1856, acknowledging the receipt of copies of the Journal and Proceedings of the Academy, and enclosing a resolution of thanks adopted by the Academy at St. Louis.

From the Boston Society of Natural History, dated June 26th, 1856, acknowledging the receipt of the Proceedings of the Academy, (Vol. 8, No. 1, Title and Index,) and the Journal, (N. S. Vol. 3, part 2.)

From the Librarian of the British Museum, acknowledging the receipt of the Proceedings of the Academy, (Vol. 6, Nos. 7, 12, and Vol. 7, No. 1.)

From F. A. Sauvalle, dated Havana, June 2, 1856, transmitting a collection of shells.

From the Royal Society of Sciences of Liege, dated Bonn, April 20th, 1856, transmitting their Memoirs, acknowledged this evening.

From the Natural History Union of Prussian Rhineland and Westphalia, dated March 24th, 1856, transmitting their publications acknowledged this evening.

Dr. Leidy read a paper entitled, "Notice of some Remains of Extinct Vertebrated Animals, by Joseph Leidy, M. D.," which was referred to a committee consisting of Dr. T. B. Wilson, Dr. Le Conte, and Mr. Haldeman.

Mr. Ashmead stated that, he had observed during the past summer an unusual scarcity of marine algae at Beesley's Point, some species usually found in shallow waters having entirely disappeared. Mr. A. attributed this to the intense cold of last winter causing the shallow bays and ponds to be frozen to the bottom. When the ice broke up, the seaweed adhering to it would be carried away. Whole beds of planted oysters were thus lost. The *Heterodon platyrhynus*, generally very abundant, was this year almost extinct. Dr. Leidy stated that he had been informed by the fishermen, that immense numbers of crabs were destroyed by the cold, so that this season they were quite scarce. Mr. Haldeman had observed numbers of evergreens killed by the winter's cold.

September 9th.

DR. BRIDGES, Vice President, in the Chair.

A paper was presented entitled, "Researches upon the Cyprinoid Fishes inhabiting the fresh waters of the United States of America, west of the Mississippi Valley, from specimens in the museum of the Smithsonian Institution, by Charles Girard, M. D.," which was referred to a Committee consisting of Drs. J. A. Meigs, Rand, and Hallowell.

September 16th.

MR. LEA, Vice President, in the Chair.

Letters were read—

From the Royal Academy of Sciences of Madrid, dated December 31st, 1854, transmitting their publications acknowledged this evening.

From the Smithsonian Institution, dated Washington, June 18th, 1856, acknowledging the receipt of Vol. 8, No. 2, of the Proceedings of the Academy.

From the American Philosophical Society, dated September 3d, 1856, acknowledging the receipt of the Journal, (N. S. Vol. 8, part 2,) and the Proceedings (Vol. 8, Nos. 1, 2, 3), of the Academy.

Dr. Leidy remarked that, he had observed the eyes of the Katy-did (*Platyphylum concavum*) which during the day are translucent and greenish, at night assume a deep cherry red color. Upon experimenting with the insect he found that, when the light was excluded, in the course of a few hours the eyes gradually became dark red, and after a restoration of light they again became translucent and greenish. The phenomenon was not positively explained, but it was supposed to belong to the same category of changes, observed in the skin of certain reptiles and cephalopods; i. e. the coloring matter of the eyes probably is composed of chromatophora, or contractile pigment cells, which according to the condition of contraction exhibit a difference in color.

Dr. Leidy also directed the attention of the members to several shells of the oyster and clam (*Ostrea virginiana* and *Venus mercenaria*) much perforated, which are common on the ocean shore, where they are noticed by all visitors. Dr. L. had for a long time suspected that the perforations were due to some other molluscan animal or a worm; and he had frequently sought for them. The last summer, in dredging, in company with Mr. Ashmead and Prof. Baird, on an old oyster bed, at Great Egg Harbor, New Jersey, a large number of these perforated shells were obtained, and all of them were observed to be occupied by a sulphur yellow sponge of the genus *Cliona*. This boring sponge forms an extensive system of galleries between the outer and inner layer of the shells, and protrudes through the perforations of the latter tubular processes, from one to two lines long and one-half to three-fourths of a line wide. The tubes are of two kinds; the most numerous being cylindrical and expanded at the orifice in a corolla form, with their margin thin, translucent, entire, veined with more opaque lines, and with the throat bristling with silicious spicules. The second kind of tubes are comparatively few, about as one is to thirty of the other, and are shorter, wider, not expanded at the orifice, and the throat unobstructed

with spiculæ. Some of the second variety of tubes are constituted of a confluent pair, the throat of which bifurcates at bottom. Both kinds of the tubes are very slightly contractile, and under irritation may gradually assume the appearance of superficial wart-like eminences within the perforations of the shell occupied by the sponge. Water obtains access to the interior of the latter through the more numerous tubes, and is expelled in quite active currents from the wider tubes.

In structure the sponge is composed of an intertexture of granular matter and pin-like silicious spiculæ. Several species of *Cliona* are indicated by European naturalists, but are not characterised with sufficient detail to determine whether the one above indicated is distinct or not from them.

Dr. L. further added, it might appear only of scientific interest to observe a structure so low as the sponge is classified in the organic kingdom, endowed with the power of penetrating such dense and hard bodies as the shell of the clam and oyster, but he suspected that the agency of the boring sponge was a highly important one in the sequence of natural phenomena, as it is a means by which dead shells are rapidly decomposed to be dissolved in the ocean water, where they may again serve as the elements of construction of the habitations of the rising generations of molluscan animals. In confirmation of this view Dr. L. stated, that an extensive bed of oysters, which had been planted by Mr. Thomas Beasley, at Great Egg Harbor, and which was in excellent condition three years since, had been subsequently destroyed by an accumulation of mud. The shells of the dead oysters, which were of large size and in great number, in the course of two years have been so completely riddled by the boring *Cliona* that they may be crushed with the utmost ease, whereas without the agency of this sponge the dead shells might have remained in their soft, muddy bed, devoid of sand and pebbles, undecomposed perhaps even for a century.

September 23d.

Mr. ORD, President in the Chair.

Mr. Lea presented a paper entitled, "Description of the Byssus in the genus *Unio*, by Isaac Lea," which was referred to a committee consisting of Dr. T. B. Wilson, Dr. Bridges, and Mr. Vaux.

September 30th.

DR. BRIDGES, Vice President, in the Chair.

The Committee on Dr. Leidy's paper read 2d inst., on Dr. Girard's paper read 9th inst., and on Mr. Lea's paper read 23d inst., severally reported in favor of publication in the Proceedings of the Academy.

Notice of some remains of extinct Vertebrated Animals.

By JOSEPH LEIDY, M. D.

1. *LEPTAUCHENIA MAJOR*, Leidy. In an examination of a collection of fossils obtained by Dr. F. V. Hayden, in Nebraska, for the St. Louis Academy of Science, I observed the mutilated jaws of a larger species of *Leptauchenia* than that previously characterized under the name of *L. decora*, (Pr. A. N. S., Phila., viii. 38.) In the upper jaw there are seven molars, forming nearly a continuous row, pre-

ceded by a small curved, conical canine. The anterior three pre-molars possess a large outer lobe, and a postero-internal column, which is nearly obsolete in the first of the series, and is best developed in the last. The fourth pre-molar has a symmetrical pair of lobes as in ordinary ruminants.

In a specimen of the lower jaw belonging to *L. major*, and containing several true molars, there are also three pre-molars. The last of the latter had been but a short time protruded. Its crown, in the general form, is like the outer part in the corresponding tooth of the deer. The antepenultimate pre-molar has a trihedral crown, of which the inner and posterior sides are depressed. The intermediate pre-molar belonged to the temporary series, and has its crown nearly worn away. The specimen of the lower jaw indicated proves that the fragment of a lower jaw containing several pre-molars, the canine, and incisive alveoli, previously referred to *L. decora*, does not belong to that genus.

Comparative measurements of *L. decora* and *L. major* are as follows:—

	<i>L. decora.</i>	<i>L. major.</i>
Series of seven upper molars, - - - -	25 lines	32 lines.
“ upper true molars, - - - -	14 “	20 “
“ lower “ “ - - - -	15 “	21 “

2. PROTOMERTX HALLI, Leidy.

Founded upon a fragment of the lower jaw, containing alveoli for three incisors to one side of the symphysis, and followed immediately by the canine. The latter is small and has a laterally compressed, obtuse crown, somewhat resembling the upper canine of the Llama. Succeeding the canine after a short interval is the first pre-molar, with the crown broken off, but which apparently had the same form as in the canine. After another interval of about one-third of an inch, there are two pre-molars, inserted by two fangs, and having a broad, laterally compressed, pyramidal crown.

The animal is most probably a ruminant, partaking of the characters of the camel and the suiline families.

Specimen obtained by Dr. F. V. Hayden, at Bear Creek, Nebraska Territory. Formerly supposed to belong to *Leptauchenia decora*.

The species is dedicated to Prof. James Hall, the eminent paleontologist.

3. OREODON MAJOR, Leidy.

Ancient Fauna of Nebraska, 55.

Having the opportunity of examining an entire skull of *Oreodon major*, in the St. Louis collection of Nebraska fossils, obtained by Dr. Hayden, I find it is really a distinct species, being characterised, not only by its larger size than the other described species, but from its possessing large inflated tympanic bones, which is not the case in *O. Culbertsonii* and *O. gracilis*. This latter character might be supposed to be generic, but it is the only important anatomical feature in which *O. major* differs from the other species.

Comparative measurements of the skull of the three species are as follows:—

Oreodon major, - - -	length 8½ in.	- - -	breadth 5½ in.
“ Culbertsonii, - - -	“ 7½ in.	- - -	“ 4½ in.
“ gracilis - - -	“ 5 in.	- - -	“ 3 in.

4. AGMOCERUS MAJOR, Leidy.

A larger species than *A. antiquus*, indicated by a single inferior true molar. It is the first or second, and measures three-quarters of an inch antero-posteriorly and half an inch transversely.

Specimen in the Nebraska collection made by Dr. Hayden, for the St. Louis Academy of Sciences.

5. ENTELONDON INGENA, Leidy.

A huge species, indicated by several mutilated canines, the anterior extremity of a lower jaw without teeth, and the crown of an inferior molar tooth. The chin of the fragment of a jaw is 4½ inches in depth and 5 inches in breadth at

the basal tuberosities. The crown of the lower true molar tooth is nearly an inch and a half antero-posteriorly and an inch transversely.

Specimens in the collection made in Nebraska by Dr. Hayden, for the St. Louis Academy of Sciences.

6. *PALŒOCHÆRUS PROBUS*, Leidy.

A species indicated by a superior first true molar, and a fragment of the lower jaw with the last pre-molar and the succeeding two true molars, all of which have the same form as in *Palæochærus typus*. Diameter of the superior molar 6 lines; antero-posterior diameter of the second lower true molar 7 lines; do. of the last pre-molar 6 lines.

Specimens from the collection made in Nebraska by Dr. Hayden, for the St. Louis Academy of Sciences.

7. *MANATUS ANTIQVUS*, Leidy.

The species is predicated on fragments of ribs found in the miocene deposits of New Jersey and Virginia, and on a fragment of a rib and an isolated molar tooth, discovered by Capt. Bowman, U. S. A., in the sands of Ashley river, South Carolina. The tooth apparently corresponds to the sixth or seventh upper molar of *M. latirostris*, Harlan, than which it is considerably larger. It has no anterior basal ridge, but from both of the inner lobes of the crown the summits are prolonged in a curved line to the middle of the outer lobes. The specimen measures in both diameters $9\frac{1}{2}$ lines.

8. *HYDROCHÆRUS ÆSOP*, Leidy.

Oronys Æsopi, Leidy. Pr. A. N. S., vii, 241.

Portions of two molar teeth in the collection of Capt. Bowman, from Ashley river, S. C., prove that a fragment of an incisor tooth from the same locality and previously referred to *Oronys Æsopi*, really belongs to a species of *Hydrochærus*, about as large as the *H. capybara* of South America.

9. *COMPESAUROS PRIBCUA*, Leidy.

The name is proposed on the remains of a saurian, obtained from the coal field of Chatham Co., N. C., consisting of four teeth, which have been submitted to my inspection by Dr. F. A. Genth. The teeth vary in size, are compressed conical, nearly as broad as long, slightly curved, with opposed truncant, denticulate edges, constricted at the base, and apparently have been inserted by a compressed cylindrical fang. The teeth are solid; the enamel is striated; and in the larger specimens the base is longitudinally ribbed. They resemble those of the lacertian *Palæosaurus* from the magnesian conglomerate of England; but in the latter genus the teeth are hollow.

Accompanying the teeth is the specimen of a coprolite, containing a few visible ganoid fish scales.

Researches upon the Cyprinoid Fishes inhabiting the fresh waters of the United States of America, west of the Mississippi Valley, from specimens in the Museum of the Smithsonian Institution.

By CHARLES GIRARD, M. D.

The fishes which are the subject of the present memoir, were collected at different times and periods, by several naturalists and surgeons attached to the various surveys undertaken within the five years past.

And first of all, there is the survey of the United States and Mexican boundary, from 1851 to 1855. John H. Clark, who accompanied Col. J. D. Graham, in 1851, collected extensively in the rivers and creeks of Texas and New Mexico. Under Major W. H. Emory, now commissioner of the boundary line, numerous collections were made by Dr. C. B. Kennerly, in Texas, in the valley of the Rio Grande and provinces of Chihuahua and Sonora.

The survey of routes for a railroad to the Pacific was commenced in 1853,

and continued until 1855. Lt. A. W. Whipple, under whose command the survey near the thirty-fifth parallel of latitude was effected, in securing the services of Dr. C. B. Kennerly, contributed very largely to our collections of fishes from Texas, and the numerous tributaries of the Arkansas River. H. B. Möllhausen, artist to the same expedition, showed also much zeal and industry for collecting.

The survey near the thirty-second parallel of latitude, western end, under Lt. J. G. Parke, contributed a few specimens, collected by Dr. A. L. Heermann.

The eastern end of the same thirty-second parallel was explored by Capt. John Pope, who having attached to his party Dr. Geo. G. Shumard, interesting specimens were obtained therefrom.

The survey of the partial routes on the Pacific side, under Lt. R. S. Williamson, Dr. A. L. Heermann being surgeon and naturalist to the party, a large collection of fresh water fishes, amongst which were several Cyprinoids, was made in the valley of the San Joaquin River, and the Tulare Valley.

Subsequently, the same officer explored the Sacramento Valley from San Francisco, Cal., to Astoria, Or., having Dr. John S. Newberry as naturalist, who secured many interesting members of the family of fishes now under consideration.

The survey of the route near the thirty-eighth and thirty-ninth parallels, under the late Capt. Gunnisson, and of the forty-first by Lt. E. G. Beckwith, secured many interesting specimens from the valley of the Great Salt Lake and Humboldt River.

The survey of the northern route, under Gov. I. I. Stevens, was as fruitful in many respects as both the United States and Mexican boundary survey, and the survey of the thirty-fifth parallel. Dr. George Suckley, Dr. J. G. Cooper, and Dr. John Evans, proved indefatigable in their efforts for collecting.

The upper Missouri and Yellow Stone rivers were explored by Dr. F. V. Hayden, under the protection of Col. A. Vaughan, and thus were we made acquainted with the ichthyic fauna of those remote waters.

Lt. D. N. Couch, U. S. A., explored, in the winter of 1852-3, the Mexican provinces of Tamaulipas, New-Leon, and Coahuila, thus adding materials towards an elucidation of the natural history of the country south of the Rio Grande del Norte (Rio Bravo); and but partially explored by the United States and Mexican boundary commission.

Valuable specimens from Platte or Nebraska river, the valley of the Great Salt Lake of Utah and Humboldt river, were also received from the late J. Soule Bowman.

To John Potts, Esq., of Chihuahua, we owe some very interesting species from the hydrographic basin of Chihuahua river, and the valley of Mexico.

One species was purchased in the market of the city of Mexico by Major Wm. Rich.

The species formerly described, from the River Zuni, collected by Dr. Woodhouse, under Capt. L. Sitgreaves, are likewise included in this prodomus.

Thus the country embraced within these surveys and fields of explorations, is limited eastwardly by the valleys of the Missouri and Mississippi, and westwardly by the Pacific ocean, extending from Puget Sound and the British possessions at the North, to the valleys of the Rio Gila and Rio Grande del Norte (Rio Bravo) to the South, and even including the Mexican provinces of Tamaulipas, New Leon, Coahuila, Chihuahua and Sonora.

The investigations of such an amount of materials could not be extemporised. Indeed, even investigations upon these various collections could not have been traced each separately in the order in which they were collected. From a preliminary examination of the first lot received in 1851, I became very soon impressed with the difficulty of the task, and foresaw the utter impossibility, at that time, to do anything like justice to the subject.

In the mean time, however, a *Notice upon a collection of fishes from the southern bend of the Tennessee river, in the State of Alabama, by Louis Agassiz*, was published,* containing several members of the Cyprinoid family. And some time

* Amer. Journ. of Sc., 2d. ser. xvii. 1854, pp. 297, 353.

afterwards appeared a *Synopsis of the Ichthyological Fauna of the Pacific slope of North America, chiefly from the collections made by the U. S. Expl. Exped. under the command of Capt. C. Wilkes, with recent additions and comparisons with eastern types. By the same author.**

These two papers, though anticipating some of the following results, were greeted with a hearty welcome, and I can only regret that the second was not concluded up to the time I am writing. I have delayed entering into this subject as long as was consistent with the duties imposed upon me.

In both of them, we find the laudable desire of attempting to bring back into use, the long forgotten genera of Rafinesque, which fell into disuse because of their own imperfection; and if they have not passed into the common nomenclature of the day, it was owing to their defect, more than to the partiality of naturalists. For we may well imagine how any one would feel when rebuilding another's work, as little known to the author as to the commentators themselves.

And yet, for my part, I have always looked upon the restoration of Rafinesque's genera and species as highly desirable, so soon as they had once been proposed and introduced into science as names. But in order to do justice to the scheme, it was necessary to the undertaking that one should go to the very ground trodden over by Rafinesque himself, his book in hand, during all the seasons of the year, ay, even for years in succession, to enable us to discriminate between that which Rafinesque really observed, and that which is imaginary.

That the *Ichthyologia Ohionensis* has been, and still is a stumbling block, is fully evinced by the fact that Dr. J. P. Kirtland, the Ohio ichthyologist, of untiring and energetic zeal and perseverance, was baffled in many of his attempts to determine Rafinesque's genera and species.

These genera and species, thus restored by Prof. Agassiz, may therefore not be received by all ichthyologists as the final settlement of that much controverted question. Be it as it may, that is: whether the identification be right or wrong, since we must have these names, I sincerely hope they will now be adopted, once for all, as proposed.

Since circumstances have compelled me to write this memoir before the completion of Agassiz's synopsis, I have restored the balance of Rafinesque's genera in the family of Cyprinoids: such are *Plargyrus* and *Semotilus*. Once upon that field of inquiries I reverted to Heckel's genera *Argyreus* and *Leucosomus*, and shewed their claim for admission upon the same general principles and canons of scientific nomenclature.

On a former occasion the genus *Leucosomus* was altogether misunderstood by me, and from an advice of mine it thus entered into the "History of the Fishes of Massachusetts, by Dr. D. H. Storer." Prof. Agassiz was led into the same error.† Heckel by inadvertence applies the name of *Cyprinus chrysoleucus*, Mitch., to *Leuciscus pulchellus*, Storer, as shown by the figures given of its teeth and the wording of its generical diagnosis. *Leucosomus*, therefore, is identical with *Cheilonemus*, and accordingly is the name to be adopted. *Cheilonemus* was proposed for *Leuciscus pulchellus*, and allied species, when it was supposed that *Leuciscus chrysoleucus* would constitute the type of the genus *Leucosomus*. But it is now well ascertained that *Leuciscus chrysoleucus* of Mitchell belongs to Rafinesque's genus *Luxilus*; and *Luxilus* has the priority over *Leucosomus*.

Leuciscus gracilis of Richardson, referred by Heckel to *Leucosomus*, is of a different generic type.

As to the genus *Argyreus*, Heckel includes in it two species generally distinct. *Cyprinus atronotus*, Mitch., and *Cypr. rubripinnis*, Mus. Par. MS. But *Cyprinus rubripinnis* is identical with *Leuciscus cornutus*, and since *Leuciscus cornutus* is to enter the genus *Plargyrus* of Rafinesque, *Cyprinus atronotus* remains as the type of the genus *Argyreus*, which again is identical with *Rhinichthys*. It must be recollected, however, that the teeth figured by Heckel under the name of *Argyreus rubripinnis*, are those of *Plargyrus cornutus*.

*Amer. Jour. of Sc., 2d. ser. xix. 1855, pp. 71, 215.

†Amer. Jour. of Sc., 2d. ser. xix. 1855, p. 225.

All the species referred to in this memoir I have seen and examined; there is not a solitary fact here recorded that was not the result of personal researches.

On several occasions I have referred to species from the Atlantic States of the Union, and even from the northern lakes, but it will be obvious to every one that it was only on such occasions as could not well be omitted without sacrifice to the completeness of the subject.

I have aimed at concision, as far as consistent with the nature of the task. It was deemed unnecessary to recall, ever and anon, the history of any particular genus, unless it happened to be intricate, for, whoever is interested in the subject, is sufficiently familiar with it. It would be different were I to write a popular work on our fishes.

In the diagnosis of the genera I have often repeated characters shared by many of them; these repetitions I am convinced are needful to their proper understanding. It may not appear so to a few ichthyologists; but I write for naturalists, for the reader who seeks after general information. Besides, the method I follow is the natural, the true method, that which has superseded the artificial method of the last century. In describing the teeth, I have adopted Heckel's phraseology, since it appears to me to answer to the present wants of Ichthyology.

The coloration, as a general rule, is described from specimens preserved in alcohol, in which the brilliancy of the hues is seldom preserved, and occasionally quite altered.

In the course of these investigations I have carefully compared the fishes of our hemisphere to those occurring in the waters of the eastern hemisphere; and when genera and species, either of fishes or reptiles, have, at any time, been described as new, it was the result of such comparative study, shunning display of loose erudition and false criticism, which too often leads into error the true observer.

I have thus added many new genera and species to the known lists. This cannot be surprising; a country so vast as North America, irrigated by so many branching streams and large bodies of waters in the shape of lakes and numerous ponds, a country comparatively little explored, was to yield many species unknown to our predecessors in the field. A superficial knowledge of the history of ichthyology in North America, would at once explain how it is that a "Synopsis of the Fishes of North America," published in 1846, should not have proved a full and complete record of all existing fishes of the country: a synopsis which, moreover, only professes to give such species as were known at that time. If we are so fortunate as to be able to add to the known catalogue of genera and species, let us not lose sight of both the time and the circumstances under which we have accomplished it. Recriminations, in that respect, are not likely to advance much our knowledge on the subject, and furthermore, it places a co-temporary exactly in the same situation towards the next coming generations as the former generations hold towards him.

Most of the new genera which I propose have been designated by words taken from the North American Indians, as being more euphonic than any one I might have framed from the Greek. The classic literature has already furnished so many names that there are but few instances in which a name might yet be coined and express what it is intended to represent. I offered this remark as a mere statement; not as an apology.

CYPRINI.

But two genera of this group or tribe, whichever called, are included in this memoir. And curious to say one is provided with a buccal barbel, and the other not. The presence or absence of barbels, therefore, does not seem of primary import here. The teeth are of the molar kind (*Dentes molares*), of the grinding type (*D. masticatorii*), without grooves or ridges, and are disposed upon two permanent—and a third, deciduous—rows: 3—2 | 5—5 | 2 | 3. The ventrals are inserted in advance of the anterior margin of the dorsal.

We had a fine opportunity of studying the genus

MYLOCHEILUS, Agass.

thanks to the numerous specimens collected by Lt. Trowbridge. The characters of this genus are as follows: Head elongated and sub-conical, rounded upon the snout, which overlaps the lower jaw. The mouth is sub-terminal, horizontal, of medium size and provided upon its angle with a maxillary barbel. The eye is well developed. The isthmus rather narrow. The body is elongated, lanceolated, compressed, sub-fusiform in profile. Pectoral fins slenderer than the ventrals; the latter being inserted in advance of the anterior margin of the dorsal. Caudal fin furcated. Scales of medium size; lateral line following the middle of the flanks. The pharyngeal bones are stoutish, expanded upon their convexity, with the inferior limbs very short. The teeth are inserted upon a very much inclined plan, raised from the surface of the bone itself, from below upwards. They are disposed upon two permanent rows of five and two, and a third deciduous row of three in the thickness of the gum: 3 | 2 | 5—5 | 2 | 3. They are of the molar kind of the grinding type, but without grooves and ridges.

1. **MYLOCHEILUS LATERALIS**, Agass. & Pick. Amer. Journ. of Sc. 2d ser. xix. 1855, 231.

Our specimens are from Fort Steilacoom, Puget Sound, W. T., and were collected by Dr. Geo. Suckley, U. S. A., under Gov. I. I. Stevens.

2. **MYLOCHEILUS FRATERCULUS**,—is closely allied to the preceding by the shape of its pharyngeal bones, differing from it by a more slender body, much smaller head and smaller eye. The color is too far gone to have anything said about it.

From Monterey, Cal., where specimens were collected by Lt. W. P. Trowbridge, U. S. A.

3. **MYLOCHEILUS CAURINUS**.—*Cyprinus (Lauiscus) caurinus*, Rich. Faun. Bor. Amer. iii. 1838, 304. Has much of the general aspect of the two preceding species, more, perhaps, of *M. fraterculus* than *M. lateralis*. The most prominent difference resides in the pharyngeal bones being less expanded upon the superior limb, which is much more developed also. The inferior limb is also more slender. The head is more elongated, more conical than in *M. lateralis*, and larger than in *M. fraterculus*. The mouth is larger than in either of the two species just referred to.

From Astoria, O. T.; numerous specimens collected by Lt. W. P. Trowbridge, U. S. A.

The genus we next introduce, and which has received the appellation of

MYLOPHARODON, Ayres,

is most closely related to *Mylocheilus*. The species which it includes are remarkable for their elongated body, their sub-conical and tapering head, their deeply cleft mouth, and, like the species of *Mylocheilus*, they have the ventrals inserted in advance of the anterior margin of the dorsal, the caudal furcated, and a narrow isthmus. But *Mylopharodon* has no barbels upon either maxillaries or the angle of the mouth. The pharyngeal bones are likewise stoutish, but the inferior limb is more elongated than in *Mylocheilus*, though a little smaller than the upper limb. We observe the same system of dentition: an external deciduous row of two or three, and two permanent rows of two and four or five: 2 | 2 | 5—5 | 2 | 2, or 3 | 2 | 4—4 | 2 | 3. But the crown is much more compressed than in *Mylocheilus*.

1. **MYLOPHARODON CONOCEPHALUS**.—*Gila conocephala*, B. & G. Proc. Acad. Nat. Sc. Philad. vii. 1854, 134.

From San Joaquin River, Cal.—Dr. Heermann.

2. **MYLOPHARODON ROBUSTUS**, Ayres, Proc. Cal. Acad. Nat. Sc. i. 1855, 33. San Francisco, Cal.—Dr. Newberry.

CATOSTOMI.

What distinguishes the Catostomi as a peculiar group, consists, in the first place, in the structure and position of the mouth; it is surrounded with large and fleshy lips, situated under the protruding snout, and has no barbels. The pharyngeal bones are sickle-shaped, varying in the curvature of the dental portion and also in the inferior branch. The teeth are numerous, disposed upon one single series; the inferior ones being longest, the others diminishing in size upwards. To use the expression of Heckel, the teeth are pectiniform (*Dentes pectiniformis*), that is, arranged like a comb. The anterior margin of the dorsal is situated in advance of the insertion of the ventrals.

Modifications of these characters, associated with others, will furnish the means of distinguishing the genera.

The want of more materials upon which the genera *Carpiodes*, *Ictiobus*, *Bubalichthys* and *Cycleptus* are founded, has prevented us entering into the discussion of their generic value. The two following species being the only ones at our command, we introduce them without preamble.

CARPIODES DAMALIS.—I have before me a specimen of this species measuring seven inches and three-quarters in total length. The greatest depth of the body is contained about three times and a half in that length, whilst the head constitutes the fifth part of it. The dorsal is much longer than high anteriorly; its anterior margin is nearer the end of the snout than the insertion of the caudal fin, which is posteriorly concave. The origin of the ventrals is situated opposite the fifth developed ray of the dorsal, the seventh in the series. The pectorals are small. The branchiostegals are three on either side.

D 27; A 10; C 4, 1, 8, 8, 1, 3; V 10; P 16.

The anterior two rays, in both the dorsal and anal fins, are rudimentary, as also the anterior one in the ventrals.

The eye is sub-circular; its diameter being contained four times and a half in the length of the side of the head. The snout is sub-conical. A line drawn perpendicularly to the angle of the mouth would pass in advance of the pupil. The sub-opercle is largely developed, and contrasts greatly with its reduced size in *C. (I.) tumidus*.

The scales are very large; thirteen lateral rows may be counted from the anterior margin of the dorsal to the insertion of the ventrals. They are a little higher than long. The lateral line undergoes a slight fall upon the thorax, then runs straightway to the base of the caudal along the eighth row of scales under the anterior margin of the dorsal.

This species was collected by Dr. Geo. Suckley, U. S. A., in Milk river, an affluent of the Upper Missouri, along the R. R. route explored by Gov. I. I. Stevens.

We have before us half a dozen small specimens from three to three inches and a half in total length, which are closely allied to the preceding species. They were collected in the Arkansas river, near Fort Smith, by Dr. Geo. G. Shumard. A further identification could not be attempted.

ICTIOBUS TUMIDUS.—*Carpiodes tumidus*, B. & G. Proc. Acad. Nat. Sc., Philada., vii. 1854, 28.—Should all the sub-divisions of the genus *Carpiodes* be admitted, then this species, from the Rio Grande del Norte (Rio Bravo), belongs to that of *Ictiobus*.*

The genus

MOXOSTOMA, Rafin.

may be circumscribed by characters more natural than the preceding ones. And the most striking of these, it must be conceded, is the absence of that lateral

* There can be no question about the etymology of this name, from *ἰχθύς* and *αἶμα*, which would spell *ichthyobus*, but Rafinesque choosed to write *Ictiobus*, which is quite as tasteful, if not more so. The "Nomenclator Zoologicus" must have satisfied every one, that confusion alone would be the result of re-spelling something like thousands of names.

line possessed by almost all fishes. The body is elongated and compressed; the head small; the mouth small also, opening obliquely forwards and downwards. The lips being small and transversally ridged; the inferior one being slightly bilobed. The anterior margin of the dorsal is situated in advance of the insertion of the ventrals. The dorsal fin itself is either higher than long, or else its length is equal to its height, varying somewhat according to the sexes, as well as the anal, which is, however, always deeper than long. The shaft of the pharyngeal bones constitutes a very open curve, the convex margin of which is regular and entire. The teeth themselves are very much compressed, strongly curved inwardly, and much larger inferiorly than superiorly.

To this genus we add four new and very distinct species, inhabiting the South Western waters.

1. *MOXOSTOMA CLAVIFORMIS*.—This species has been known to us for several years. Its general outline has a club-shaped appearance, a trait though more or less general, is especially characteristic here. The largest specimens which we have examined are four inches in total length, and in all probability not very young. The greatest depth, taken across the pectoral region, is contained four times and a half in the total length, in which the head enters five times. The eye is circular and moderate in development, contained a little over four times in the length of the side of the head. The upper margin of the dorsal fin is sub-convex; its anterior margin is nearer the tip of the snout than the insertion of the caudal fin. The caudal is concave posteriorly; the anal narrow and deep; the ventrals are inserted opposite the fifth ray (or third developed one) of the dorsal, and their tips do not extend as far back as the tips of the posterior rays of the dorsal fin when bent along the dorsal line.

D 13; A 10; C 4, 1, 8, 8, 1, 3; V 9; P 15.

The scales are sub-elliptical in general shape, presenting no grooves upon their lateral sections, but few upon the anterior section, and numerous posteriorly upon that section of the scale that is exposed.

The specimens were collected by H. B. Möllhausen, in Coal creek, a tributary of the South Fork of the Canadian river; along the R. R. route explored by Lt. A. W. Whipple, U. S. A.

2. *MOXOSTOMA KENNERLY*.—In its general physiognomy this species resembles *M. oblongum* more than any other of its genus. The greatest depth, taken immediately in advance of the dorsal fin, does not enter quite four times and a half in the total length. The head forms a little less than the fifth of that same length. The anterior margin of the dorsal is much nearer the tip of the snout than the insertion of the caudal; the upper margin of that fin is sub-convex and as long as high, whilst in *M. claviformis* the height is much greater than the length. The caudal is deeply concave posteriorly; the anal is deep and narrow, its extremity extending, as usual in the genus, to the base of the caudal. The ventrals have pretty much the same position as in the preceding species.

D 14; A 10; C 4, 1, 8, 8, 1, 3; V 10; P 13.

The anterior two rays, in both the dorsal and anal fins, are mere rudiments; also the anterior one in the ventral fins. The scales are not quite so long as in the preceding species. The lower lip is rather broad and very little emarginated, whilst in *M. claviformis* it is very thin and quite sub-divided.

This species was caught in Dry creek, near Victoria, Texas, by Dr. C. B. Kennerly, under Major W. H. Emory, U. S. Commissioner of the U. S. and Mexican Boundary line.

3. *MOXOSTOMA VICTORIAE*.—Form elongated, fusiform, reminding us, by its general appearance, of certain species of Mullet (*Mugil*). The greatest depth is nearly equal to the length of the head, which constitutes the fifth of the entire length, the lobes of the caudal fin excepted. The dorsal fin is higher than long,

and its anterior margin is situated nearer the tip of the snout than the insertion of the caudal fin. The latter is forked.

D 14; A 10; C 6, 1, 8, 8, 1, 5; V 9; P 17.

The sub-opercle is well developed; the eye is sub-circular, its diameter being contained four times and a half in the length of the side of the head. The snout is rather pointed, sub-conical, and the mouth, which is small, placed entirely in advance of the orbit. Twelve longitudinal rows of scales may be counted upon the greatest depth. The scales upon the dorsal and lateral regions are provided with a black dot or spot upon the anterior part of the exposed portion of the scale. Greatest length of specimens observed, six inches and a half.

This species was collected with the preceding, under the same circumstances and in the same locality.

4. *MOXOSTOMA CAMPBELLI*.—Sub-fusiform and elongated like the preceding species, which it resembles in its general outline, and in the proportions of the head and depth of the body towards the total length. The snout is likewise pointed and sub-conical, but the eye is much larger and the sub-opercle very exiguously developed. The position and shape of the fins do not differ materially from the preceding species, with the exception of the caudal, which is concave posteriorly instead of being forked.

D 15; A 10; C 5, 1, 8, 8, 1, 5; V 9; P 15.

The scales are smaller than in *M. kennerlyi*; thirteen rows instead of twelve are to be observed upon the region of greatest depth.

Specimens were collected in Live Oak creek, Texas, by Dr. C. B. Kennerly, under Major Emory, and in Devil's river, by John H. Clark, under Col. Graham. The species, therefore, belongs to the basin of the Rio Grande del Norte (Rio Bravo).

As regards the generic features of

PTYCHOSTOMUS, Agass.

it fell within our observation that the height of the dorsal may be either equal to its length or a little higher than long, and that the wing-like expansions of the pharyngeals is anything but characteristic of this genus. The transverse folds or ridges upon the lips are shared by *Moxostoma*, though in a lesser degree. The inferior lip is but slightly lobed. The mouth, however, is much more protractile and directed more downwards. The head is short and stout; the scales large and of the same size anteriorly and posteriorly. Finally, the conspicuous lateral line will at once distinguish it from *Moxostoma*.

1. *PTYCHOSTOMUS CONGESTUS*.—*Catostomus congestus*, B. & G. Proc. Acad. Nat. Sc. Philad. vii. 1854, 27. This species comes under this head and not of *Moxostoma*.

From the Rio Salado, Texas.—John H. Clark.

2. *PTYCHOSTOMUS ALBIDUS*.—The general physiognomy of this species reminds of us *P. congestus*, although the body is more slender and the head more elongated. The mouth is a great deal larger, as are also the scales. Greyish white above; greyish silver beneath.

Collected by Lt. D. N. Couch, U. S. A., in the Rio San Juan, near Monterey, New Leon.

3. *PTYCHOSTOMUS HAYDENI*.—The head is contained five times and a half in the total length. The body is sub-fusiform, very regular in its outline. The eye is sub-circular and moderate in its development; its diameter being contained five times in the length of the side of the head. The opercle is largely developed, whilst the sub-opercle is small, a character which is more or less general. The anterior margin of the dorsal fin is much nearer the tip of the snout than the base of the caudal. The height of that fin is a little more than its length; its upper margin is sub-concave. The caudal is forked. The origin of the

ventrals is situated in advance of the middle of the dorsal. The tips of the pectorals reach a vertical line drawn from the origin of the dorsal.

D 15; A 10; C 4, 1, 8, 8, 1, 3; V 10; P 17.

Thirteen rows of scales may be counted between the origin of the ventrals and the anterior margin of the dorsal; the lateral line running through the median row. There are two rudimentary rays at the anterior margin of both the dorsal and the anal, and one at the exterior margin of the ventrals; these are all summed up in the formula.

Specimens of this species were collected in the Yellow Stone river, by Dr. F. V. Hayden, and in the Missouri river at Fort Pierre, by Dr. John Evans.

Now then, if the principles upon which the above generic divisions are based, be sound, the species which still remain in the genus *Catostomus* must be further revised and arranged in smaller and more restricted groups.

We propose to arrange under the head of

MINOMUS,

such species as are characterised by an elongated and fusiform body; a head longer than deep; a dorsal fin either higher than long, or with both dimensions equal. The lips being tuberculated, moderately bilobed. The pharyngeals not expanded laterally, but considerably bent inwardly. The teeth compressed, decidedly bicuspid, but the inner projection more developed than the outer. The scales being nearly of the same size, but slightly smaller anteriorly than posteriorly.

1. *MINOMUS INSIGNIS*.—*Catostomus insignis*, B. & G. Proc. Acad. Nat. Sc. Philad. vii. 1854, 28.

Inhabits the Rio San Pedro, tributary of the Rio Gila.

2. *MINOMUS PLEBEIUS*.—*Catostomus plebeius*, B. & G. Proc. Acad. Nat. Sc. Philad. vii. 1854, 28.

From the Rio Mimbres, Lake Guzman, Mexico.

3. *MINOMUS CLARKII*.—*Catostomus clarkii*, B. & G. Proc. Acad. Nat. Sc. Philad. vii. 1854, 27.

From the Rio Santa Cruz.

And then giving the name of

ACOMUS

to those species in which the head is very elongated, the dorsal fin higher than long, and the scales much smaller upon the anterior region of the body than upon the posterior. The lips being papillated and very deeply cleft. The pharyngeals are gently arched and not expanded; the teeth compressed and bituberculated, the inner projection conspicuous; the outer one, obsolete, though existing.

1. *ACOMUS FORSTERIANUS*.—*Catostomus forsterianus*, RICH. Faun. Bor. Amer. iii. 1836, 116.

Inhabits British North America.

2. *ACOMUS AURORA*.—*Catostomus aurora*, AGASS. Lake Sup. 1850, 360. Pl. II. figs. 3 and 4. May not differ from the preceding.

Lake Superior.

3. *ACOMUS LATIPINNIS*.—*Catostomus latipinnis*, B. & G. Proc. Acad. Nat. Sc. Philad. vii. 1853, 388.

Rio San Pedro, tributary of Rio Gila.

4. *CATOSTOMUS (ACOMUS) GUZMANTENSIS*,—has the general physiognomy of *A. latipinnus*, owing to the great development of its fins. Is, however, very readily dis-

tinguished from the latter by the presence of much larger scales, and especially upon the dorsal region, where they are very small in *A. latipinnis*.

D 13; A 7; C 4, 1, 8, 8, 1, 4; V 9; P 17.

The anterior two rays, in both the dorsal and anal, are rudimentary; so also the exterior one in the ventrals.

The head forms the fifth of its total length; the shape is subquadrangular, subpyramidal. The eyes are small and circular. The lips are well developed and covered with large papillæ, but the posterior one is less indented than in *A. latipinnis*.

The upper regions are purplish black, with an orange lateral band from head to tail. The inferior regions are yellowish white.

Specimens of this species were collected by Dr. C. B. Kennerly, under Major Emory, in Janos River, which empties its water in Guzman Lake, State of Chihuahua.

5. *CATOSTOMUS (ACOMUS) GENEROSUS*.—It is a rather short and contracted species, particularly when compared to *A. griseus*. The head constitutes about the fifth of the total length. The eye is moderate in size and circular. The anterior margin of the dorsal fin is equi-distant between the tip of the snout and the insertion of the caudal fin. The scales are larger than in *A. griseus*. The dorsal region, as well as the flanks, are olivaceous brown, spotted with black. Inferiorly unicolor.

Specimens were collected in Cottonwood Creek, an affluent of the great Salt Lake of Utah, and brought home by Lieut. E. G. Beckwith, U. S. A.

6. *CATOSTOMUS (ACOMUS) GRISEUS*.—The body is slender, gracefully fusiform in its outline, the head forming the fifth of the entire length. The anterior margin of the dorsal is equidistant between the tip of the snout and the insertion of the caudal fin. The ventrals are inserted opposite the posterior third of the dorsal. The anal is slender.

D 13; A 10; C 6, 1, 8, 8, 1, 5; V 10; P 16.

Collected in the Sweet Water fork of Platte River, by J. S. Bowman, Esq.

Scales exhibiting radiating furrows all around. Upper regions greyish; inferior regions whitish or yellowish.

7. *CATOSTOMUS (ACOMUS) LACTARIUS*—is closely allied to the preceding species, from which it differs by a stouter head and larger eyes, and larger scales on the body. The structure of the scales themselves is very different, since the radiating furrows exist upon the anterior and posterior sections only, instead of being distributed all over the scale. The upper margin of the dorsal is concave, whilst it is nearly straight in *A. griseus*.

D 13; A 10; C 4, 1, 8, 8, 1, 5; V 11; P 17.

Greyish brown above, greyish white beneath.

Specimens of this species were collected in Milk River, affluent of the upper Missouri, by Dr. George Suckley, under Gov. I. I. Stevens.

The genus

CATOSTOMUS, Lesu.

would then be restricted to such species in which the head is moderately elongated, the dorsal fin generally longer than high, and the size of the scales less disproportionate anteriorly and posteriorly than in *Acomus*. The lips are papillated and deeply cleft. The pharyngeals provided with a little expansion inferiorly. The teeth are compressed, with the inner projection of the crown alone developed.

The type of this group is *Catostomus hudsonius*. *C. communis* would be a second species. And the following:

3. *CATOSTOMUS OCCIDENTALIS*, Ayres, Proc. Cal. Acad. Nat. Sc. i. 1854, 18.
—Agass. Amer. Journ. of Sc. 2d Ser. xix. 1854, 84.

By a singular coincidence, this species received the same specific name from two authors at a few weeks interval.

San Francisco, Cal.—Dr. Newberry.

4. *CATOSTOMUS LABIATUS*, Ayres, Proc. Cal. Acad. Nat. Sc. i. 1855, 32.

Klamath Lake, O. T.—Dr. Newberry.

5. *CATOSTOMUS MACROCHEILUS*.—This species is very different from both of the preceding ones by a larger and more elongated head, a larger mouth, and hence much larger lips, covered with large papillæ. The scales which cover the body are larger than in *C. occidentalis*, and smaller than in *C. labiatus*. The head constitutes the fifth of the total length; the horizontal diameter of the eye is contained nearly six times in the length of the side of the head. The head itself is subquadrangularly pyramidal, truncated anteriorly with the upper edge of the snout projecting. The anterior margin of the dorsal is a little nearer the end of the snout than the insertion of the caudal fin. Its upper margin is concave. The anal is well developed, for its tip extends beyond the base of the caudal. The ventrals are inserted opposite the middle of the dorsal. The pectorals are large and long.

D 17; A 9; C 5, 1, 8, 8, 1, 6; V 10; P 18.

Bluish black above; yellowish golden on the sides and whitish beneath.

Collected at Astoria, O. T., by Lieut. W. P. Trowbridge, U. S. A.

6. *CATOSTOMUS SUCKLEY*.—The head, as usual, forms the fifth of the entire length. It is subquadrangular, the upper surface rather sloping towards the blunt snout. The eye is small and subelliptical; its horizontal diameter being contained somewhat over five times in the length of the side of the head. The anterior margin of the dorsal fin is equidistant between the tip of the snout and the insertion of the caudal. Its height is equal to its length, and its upper margin is slightly concave. The posterior margin of the caudal is deeply emarginated, crescentic. The insertion of the ventrals is a little in advance of the middle of the dorsal fin.

D 14; A 10; C 5, 1, 8, 8, 1, 4; V 10; P 18.

The scales are large and but a little smaller anteriorly than posteriorly; they are subelliptical in shape, longer than deep, with their anterior and posterior margins irregular.

Specimens of this species were collected by Dr. Geo. Suckley, under Governor I. L. Stevens, in Milk River, an affluent of the upper Missouri.

7. *CATOSTOMUS BERNARDINI*.—A specimen of seven inches and a half, slender and graceful. The head forms a little less than the fifth of the total length. The eye is large and subcircular; its horizontal diameter entering a little over four times in the length of the side of the head. The upper margin of the dorsal is subconvex, the tips of the posterior rays reaching a vertical line which would intersect the anus. The caudal is subcrescentic posteriorly. The ventrals and pectorals are well developed.

D 15; A 10; C 5, 1, 8, 8, 1, 5; V 10; P 16.

Uniform purplish black above, yellowish white beneath.

Specimens of this species were collected by Dr. C. B. Kennerly, under Major W. H. Emory, at San Bernardino, in the upper waters of the Rio Huagui, west of the Sierra Madre, Mexico.

CHONDROSTOMI.

This group must include a much greater number of genera and species than was formerly anticipated. But, as a group, it must be based upon characters very different from those derived from the structure of the mouth. Indeed, those cartilaginous maxillary sheathes so prominent in *Chondrostoma*, *Chondrochilus*, *Chondrorhynchus* and *Lavinia*, gradually become less and less conspicuous, until we find but a thin pellicle, such as occurs in other groups of the same family. The characters of *Chondrostomi*, as derived chiefly from the American representatives, consist in the absence of barbels; in the position of the mouth, which is

generally overhung by the upper jaw, and sometimes both jaws are equal. The pharyngeal teeth are of the grinding type and cultriform kind (*Dentes cultriformes*), disposed upon a single series, with one exception only, and that occurs occasionally in *Campostoma*. I say *occasionally*, because in the majority of cases there is also but one single row in the latter. *Exoglossum* is removed from this group, of which it has none of the characters, except the absence of barbels.

We introduce the tribe by the genus

CAMPOSTOMA, Agass.,

which may be characterised as follows: Head subconical; body subfusiform; both compressed. Snout obtuse and protractile; mouth inferior, though its cleft is horizontal; lips very conspicuously developed; no barbels or cirrhi. Eyes of moderate development. Isthmus very wide. Origin of ventrals situated in advance of the anterior margin of the dorsal. Caudal furcated. Scales longer than high. Pharyngeal bones strongly curved, with a small dilatation upon their convexity. Teeth of the cultriform kind, of the grinding type, occasionally slightly hooked. They are disposed upon a double row of four and one, in the following manner: 4—4, or 1 | 4—4 | 1.

1. *CAMPOSTOMA ANOMALUM*, Agass. Amer. Journ. of Sc. 2d ser. xix. 1855, 219. —*Rutilus anomalus*, RAFFIN. Ichth. Ohiens. 1820, 52.

2. *CAMPOSTOMA ORNATUM*—is larger, more elongated and more fusiform than *C. anomalum*. The head enters four times and a half in the total length. The diameter of the eye enters nearly six times in the length of the side of the head. The scales are much smaller than in *C. anomalum*.

D 8+2; A 8+2; C 7, 1, 9, 8, 1, 6; V 8; P 16.

The upper regions are purplish black; the inferior regions golden brown and yellow, with black spots distributed over the flanks. A black patch at the base of all the fins, otherwise the latter are orange or yellowish brown.

From Chihuahua River and a tributary only a few miles long. Collected by John Potts, Esq.

3. *CAMPOSTOMA FORMOSULUM*.—This species resembles more *C. anomalum* than *C. ornatum*; the most conspicuous difference between it and the former consist in the presence of larger scales. The ground color is alike, but in *C. formosulum* black irregular spots are distributed all over the upper region of the body.

Numerous specimens collected in the Rio Sabinal, a tributary of the Rio San Antonio, Texas, by Dr. C. B. Kennerly, under W. H. Emory, Commissioner U. S. and Mexican Boundary.

4. *CAMPOSTOMA NASUTUM*.—It is a shorter and more compact species, with the peduncle of the tail rather tapering. Its most prominent character consists in its thick and protruding snout, which overlaps the lower jaw more than in the species already referred to. The ground color is greyish above, and whitish or yellowish beneath; upper region of body and flanks occasionally marmorated. A black patch at the base of the caudal and dorsal fins.

Specimens were collected by Lieut. D. N. Couch, U. S. A., at Cadereita, and near Monterey, New Leon, in April, 1853.

From the foregoing species of moderate size, we pass to a genus composed of quite small fishes, differing from the former by the position of the ventral fins, which are inserted either immediately under the anterior margin of the dorsal fin or posteriorly to it, never in advance, as in *Campostoma*. To designate these we have selected the name of

DIONDA.

They are very intimately related to the Hyborhynchi, and differing from them by a smaller and more pointed head, a smaller mouth, though constructed upon the same plan as in *Hyborhynchus*, that is, the lower jaw being thin, flat and rounded upon its periphery. The body is more slender and elongated, the snout

more protruding. The scales are either large, or else of moderate size, and the lateral line follows more or less the middle of the flanks. The dorsal fin is higher than long, and shorter than in *Hyborynchus*, and the anterior ray is more closely united to the next. The insertion of the ventrals is always situated posteriorly to the anterior margin of the dorsal, or under it, never in advance of it. The caudal is furcated. The pharyngeal bones are stouter than in *Hyborynchus*, the lower branch or limb has the same length as the upper; both are more curved, thus rendering the convexity of that bone more conspicuous; it is expanded as usual. The teeth are similar to those of *Hyborynchus*, being, however, not quite so compressed and not hooked. Four are observed upon one single row: 4—4.

This genus is closely allied to *Campostoma*, and since our *Dionda* are, generally speaking, small fishes, we should not be surprised at hearing that some of the species of *Campostoma*, while yet immature could not always be easily distinguished from them, for the mouth is, properly speaking, not smaller than in *Campostoma*.

The following species have fallen under our observations.

1. *DIONDA EPISCOPA*.—Slender and graceful, fusiform in profile and compressed, with the back slightly arched. The head is large, forming about the fifth of the length. The eye is large and subcircular, its diameter being contained three times and a half in the length of the side of the head. The fins are of but moderate development; the insertion of the ventrals is situated a little posterior to the anterior margin of the dorsal. The rays read as follows:

D 8+2; A 8+2; C 8, 1, 9, 8, 1, 7; V 8; P 14.

The scales are large, the lateral line following the middle of the flanks.

The dorsal region is blackish brown; a black vitta is observed along the flanks, just above the lateral line, extending from a black spot, upon the base of the caudal, to the extremity of the snout. The inferior region is yellowish white spread over with minute black dots.

Collected in the head waters of the Rio Pecos, and brought home by Capt. John Pope, U. S. A. Specimens of the same species were caught by John H. Clark, under Col. J. D. Graham, U. S. A., in Camanche Spring, a presumed tributary of the Rio Grande del Norte (Rio Bravo), or more probably without outlet.

2. *DIONDA SERRA*.—Could easily be mistaken for *D. episcopa*. Its form is slender and elongated, the dorsal outline being nearly straight; the head enters five times and a half in the total length. The eye is large and circular, its diameter entering only three times in the length of the side of the head. The insertion of the ventrals takes place immediately opposite the anterior margin of the dorsal fin. The pectorals are long and slender, more so even than in *D. episcopa*.

The dorsal region is light brown, the flanks and abdomen being silvery, with the scales of the lateral line dotted with black, imitating spots. A black spot upon the base of the caudal fin.

From the Rio Sabinal, Texas; collected by Dr. C. B. Kennerly, under W. H. Emory, Commissioner U. S. and Mex. Boundary.

3. *DIONDA TEXANA*,—is a very characteristic species. The body is rather deep upon its middle, and the lateral line somewhat depressed. The head is quite small and subconical, entering five times and a half in the total length. The eye is large and circular. The insertion of the ventral fin is placed a little posteriorly to the anterior margin of the dorsal. The dorsal region is greyish brown; the abdominal region greyish white; a diffused greyish black band may be observed along the middle of the flanks, embracing the lateral line beneath, and a black spot upon the base of the caudal. The ventrals and pectorals are yellow.

Numerous specimens were collected in the Rio Nueces, Texas, by John H. Clark, under Col. J. D. Graham, U. S. A.

4. *DIONDA PAPALIS*.—The head in this species is rather small, but rounded off upon the snout; it forms a little less than the fifth of the entire length. The body is thickish anteriorly, subcylindrical, tapering posteriorly. The dorsal and anal are proportionally well developed. The caudal is forked; the ventrals are inserted under the anterior margin of the dorsal. The scales are large. The coloration has been altered to a uniform black subsequently upon its immersion in alcohol with sundry other specimens.

Collected in Delaware Creek, a tributary of the Rio Pecos, and brought home by Capt. John Pope, U. S. A.

5. *DIONDA ARGENTOSA*.—has a small head and obtuse snout, a rather slender and compressed body. The head constitutes 2-11ths of the total length. The insertion of the ventrals is situated opposite the anterior margin of the dorsal. The scales being quite large, the lateral line is slightly deflected upon the thorax. Color of the dorsal region reddish brown; sides and abdomen as if painted over with silver or quicksilver. Fins olivaceous.

Collected in San Felipe Creek and Devil's River, two tributaries of the Rio Grande del Norte (Rio Bravo), by John H. Clark, under Col. J. D. Graham, U. S. A.

6. *DIONDA CHRYSITIS*.—Very slender and compressed; head very small and obtuse, contained six times in the total length. Eyes large and circular. Origin of ventrals opposite the anterior margin of dorsal. Upper surface of head tuberculous. Scales large. Dorsal region reddish brown; sides and abdomen as if painted with gold. A black spot upon the base of the caudal fin. Fins themselves yellowish or olivaceous.

Specimens were collected by John H. Clark, under Col. J. D. Graham, U. S. A., in Live Oak Creek, presumed tributary of Rio Pecos, or else losing itself into the ground.

7. *DIONDA MELANOPE*.—A rather short and deep body characterizes this species. The head is proportionally well developed, forming a little less than the fifth of the total length. The snout is conical and not abruptly truncated. The insertion of the ventrals is situated a little posteriorly to the anterior margin of the dorsal. Scales large. The dorsal region is blackish; the sides and abdomen are dotted with black upon a bluish lead ground, giving the whole fish a dark appearance. A black spot upon the base of the caudal fin.

From Buena Vista, Coahuila;—collected by Lieut. D. N. Couch, U. S. A.

8. *DIONDA COUCHI*.—Though closely allied to the preceding, it may readily be distinguished from it by a more elongated body and more elongated head. The snout is rounded. The eye is circular and of medium size. The ventrals are inserted posterior to the anterior margin of the dorsal. The scales are quite large. Upper regions greyish black; sides and abdomen yellowish or whitish, either unicolor or maculated. A black spot upon the base of the caudal.

Specimens collected by Lieut. D. N. Couch, U. S. A., at Guajuco, Monterey and Cadereita, New Leon, in the waters of the Rio San Juan.

9. *DIONDA PLUMBEA*.—Besides several other peculiarities of structure, this species may be distinguished from all its congeners by the size of its scales, which are the smallest in the genus.

Greyish above, whitish or yellowish white beneath. Black spot at base of caudal.

Collected in the head waters of the Canadian River (Llano Estacado), by H. B. Möllhausen, under Lieut. A. W. Whipple, U. S. A.

10. *DIONDA SPADICHA*.—This has the general aspect of *D. plumbea*, in being slender and elongated in body and head. The latter, however, is more conical and the eye smaller, the scales being but a very little larger. Colors brownish red above, whitish beneath. No spot at the base of the caudal.

From Fort Smith, Ark.;—collected by H. B. Möllhausen, under Lieut. A. W. Whipple, U. S. A.

The ten species that precede as well as the four following ones, are amongst those whose history has most perplexed us. At last we were glad to recognize the genus

HYBORHYNCHUS, Agass.

established upon a species of the Ohio and its tributaries, and believed to be *Minnidus notatus* of Rafinesque. We have examined carefully the latter species, and after a series of comparative studies we were enabled to add the following few species to the genus which we thus characterize: Head rather short, upper surface depressed; snout abruptly truncated and rounded. The mouth is of medium size, subterminal, its cleft being horizontal, the lower jaw flattened and thin, rounded upon its periphery and slightly overlapped by the snout. There are no barbels at the angles of the mouth, which do not reach a vertical line drawn in advance of the orbit. The eyes are large; the isthmus is of moderate width. Anterior ray of dorsal fin shorter than the second. The insertion of the ventrals is situated opposite the anterior margin of the dorsal or in advance of it. The caudal is furcated. The scales are large, higher than long; the lateral line follows the middle of the flanks. The pharyngeal bones are slender, and more so upon the inferior limb, which is longer than the upper and curved backwards and sideways, whilst the upper limb is gently curved inwards. The convexity of the same bone is expanded. The teeth are of the cultriform kind of the grinding type, very much compressed, slightly hooked, and consequently provided with quite a narrow grinding surface. Their disposition is upon a single row of four: 4—4.

1. *HYBORHYNCHUS PERSPICUUS*.—The head is contained five times and a quarter in the total length, instead of constituting the sixth part of it, as in *H. notatus*. The mouth and eye, both, are a good deal larger than in the latter. The insertion of the ventrals is situated immediately under the anterior margin of the dorsal. The caudal fin is more deeply furcated than in *H. notatus*.

D 9+2; A 7+2; C 10, 1, 9, 8, 1, 8; V 9; P 14.

There is a very minute rudimentary ray at the anterior margin of both the dorsal and anal, followed by a second, about half the height of the fin.

Upper region and flanks reddish; abdomen sulphur yellow; lateral line dotted with greyish purple, more distinct towards the base of the caudal upon which a dark spot exists. Fins yellowish, also with a black spot upon the anterior margin of the dorsal below the middle height. Superior portion of the dorsal, greyish, as also the external margin of the caudal.

From Arkansas River, near Fort Smith;—collected by Dr. Geo. G. Shumard.

2. *HYBORHYNCHUS TENELLUS*.—It is more slender and more compressed than even *H. perspicuus*. The head is very much depressed, subpyramidal, the snout not rounded, hence appearing quite small; it is contained five times and a half in the total length. The insertion of the ventrals is a little in advance of the anterior margin of the dorsal fin. The eye and mouth are proportionally large, and especially the scales, which are the largest among the hitherto known species of the genus. Color uniform reddish above and on the sides; yellowish beneath. A black spot upon the base of caudal fin. Otherwise the fins are unicolor.

Collected twenty miles west of Choctaw Agency, by H. B. Möllhausen, under Lt. A. W. Whipple.

3. *HYBORHYNCHUS FUMIGATUS*.—As regards the general aspect, this species is intermediate between *H. perspicuus* and *H. tenellus*. It is distinguished from both of these by more developed opercular apparatus and much smaller scales. The color is uniform pale red; the fins are unicolor, yellowish.

Specimens were collected in Antelope Creek, a tributary of the Canadian River, by Dr. C. B. Kennerly, and from Llano estacado, by H. B. Möllhausen, both under Lt. A. W. Whipple, U. S. A.

4. *HYBORHYNCHUS CONVERTUS*.—This species has a short and contracted appear

ance, covered with scales a little larger than in *H. puniceus* but smaller than in the other species of the same genus. The opercular apparatus is likewise well developed. Color light red above, yellowish beneath; a black spot upon the anterior margin of the dorsal.

From Hurrah creek, a tributary of the Rio Pecos;—collected by H. B. Möllhausen, under Lt. Whipple.

A very remarkable genus, inhabiting our western waters, is that of

PIMEPHALES, Rafin.

Its body is subfusiform when seen in profile, compressed, however, as usually. The head is large, short, and very blunt upon the snout. The mouth being small, slightly arched, and terminal; both jaws even. The eye is of moderate development. The isthmus is proportionally wide. The dorsal fin is a little higher than long, provided anteriorly with a rather thick and undivided, short and hard ray. The origin of the ventrals takes place either immediately opposite the anterior margin of the dorsal, or else a little posterior to it. The scales are rather large and the lateral line, after a slight deflection along the thorax, follows the middle of the flanks to the base of the caudal fin. The pharyngeal bones are of moderate stoutness, gently arched, the upper and lower limb nearly equal though the upper is more curved; the convex portion is regularly dilated or expanded. The teeth are of the cultriform kind of the grinding type, very slightly hooked, compressed, with a narrow grinding surface, disposed upon one single row of four: 4—4.

1. *PIMEPHALES MACULOSUS*.—It is a stouter fish than *P. promelas*, both in body and head. The latter is almost round. The anterior margin of the dorsal is equidistant between the extremity of the snout and the last scales upon the caudal fin. The origin of the ventrals is situated a little posterior to the anterior margin of the dorsal. The scales are larger also than in *P. promelas*. Upon a yellowish brown ground there are large and irregular black blotches covering more than half the entire surface of the body. The fins are yellow upon their bases and tips, and black upon their middle. The external margin of the ventrals and pectorals is pure white.

Caught in the sluice of the Arkansas near Fort Makee, and brought home by Lt. E. G. Beckwith, U. S. A.

2. *PIMEPHALES FASCIATUS*.—This species has the general aspect of *P. maculosus*, differing, however, from it by the position of the ventrals, which are inserted under the anterior margin of the dorsal fin. The scales are smaller also. The color is alternately brown and black in transverse fasciæ. Dorsal fin provided with two black spots, one anteriorly, the other posteriorly. The other fins being unicolor, with the exception of the pectorals, which are greyish upon their external margin.

From the Yellowstone river;—collected by Dr. F. V. Hayden.

Two immature specimens of this, or a similar species, were collected in Milk river, Upper Missouri, by Dr. Geo. Suckley.

We separate from both *Pimephales* and *Hyborhynchus*, under the name of

ALGOMA,

some small fishes, partaking in a measure of the characters of the genera just mentioned. The teeth are of the cultriform kind, of the grinding type, disposed upon a single row of four: 4—4. The grinding surface is nearly linear, in which respect the teeth resemble more those of *Pimephales* than of *Hyborhynchus*. The pharyngeal bones do not differ materially in all these genera. The head is small and subtruncated, mouth small, with the lower jaw the shortest, and overlapped by the upper, a feature also noticed in *Hyborhynchus*. The isthmus of a moderate size; the eye well developed. The insertion of the ventrals takes places posterior to the anterior margin of the dorsal. The latter is higher than long,

without a short and thick ray anteriorly. The anal is shaped like the dorsal. The caudal is furcated. The scales are very large; the lateral line, submedian, is slightly deflexed upon the abdomen.

The large scales will serve to distinguish, upon a first glimpse, this genus from both *Hyborhynchus* and *Pimphales*.

1. *ALGOMA AMARA*.—Ten rows of scales upon the line of greatest depth, five above the lateral line and four beneath it. The upper surface of the head and nape is flattened as in *Hydrargyra* and *Fundulus*. Dorsal region pale red; sides silvery; abdomen whitish.

Caught in a Laguna near Fort Brown, on the Rio Grand del Norte (Rio Bravo), by John H. Clark, under W. H. Emory.

2. *ALGOMA FLUVIATILIS*.—This species has the general aspect of a young *Campostoma* and might easily be taken as such. Its mouth and eye are smaller than in the preceding species. The upper lobe of the caudal is longer than the lower lobe. There are also ten longitudinal rows of scales upon the line of greatest depth. The upper surface of the head exhibits numerous small spines as fishes sometimes have during the breeding season. Color reddish brown above; yellowish brown beneath.

Collected near Monterey, New Leon, by Lt. D. N. Couch, U. S. A.

And still more curious and remarkable, is the genus

COCHLOGNATHUS, B. & G.

which, under the external aspect of *Pimphales* presents that unique peculiarity in the cyprinoid family, of having spoon-shaped bony expansions of the jaws. There is one on each side on the upper as well as on the lower jaw exactly as in the genus *Tetraodon*; their edge being sharp and cutting. The dorsal fin has the structure of that of *Pimphales*; the insertion of the ventrals is situated under the anterior margin of the dorsal, the caudal being furcated. The scales are large, and the lateral line follows the middle of the flanks. The isthmus is rather wide. The pharyngeals have the same shape and form as in *Pimphales*; the teeth, however, are more slender and concave upon the grinding surface, giving them the appearance of being bent backwards. They are of the same type, a little more conspicuously hooked, and disposed upon a single row of four: 4—4.

COCHLOGNATHUS ORNATUS, B. & G. Proc. Acad. Nat. Sc. Philada. vii. 1854, 150.

From Brownsville Texas;—collected by Capt. Van Vliet, U. S. A.

Now, then, the genus

HYBOGNATHUS, Agass.

General form elongated, rather slender and compressed. The head is sub-conical, the snout overlapping the lower jaw, which is thin and flat, provided upon its symphysis with a small tubercle. The mouth being small, subterminal, and directed horizontally forwards; there are no barbels upon its angles, which do not reach the anterior rim of the orbit. The eyes are well developed. There is a narrow isthmus. Anterior ray of dorsal longest. Insertion of ventrals situated posterior to the anterior margin of the dorsal. Caudal furcated. The scales are large, higher than long, and the lateral line following the middle of the flanks. Pharyngeal bones very much bent, with a dilatation upon the convexity, whilst the upper branch is bent inwards, so as to simulate a curve concave from above. The teeth are of the cultriform kind, of the grinding type, very compressed and slightly hooked, and provided with a very narrow grinding surface: they are disposed upon a single row of four: 4—4.

Amongst the species of this genus which we have before us, none answers specifically to the description of *H. nuchalis*. We find every where the symphysis of

the lower jaw rounded instead of angular, and, generally speaking, the eye rather large.

1. *HYBOGNATHUS ARGYRITIS*.—This species seems to come nearest to *H. nuchalis*, Agass., than any of the following ones. The eye, however, is quite large, subcircular in shape, its diameter entering a little short of four times in the length of the side of the head. The snout is rather pointed, and the mouth larger than in the species enumerated further below. The largest specimens observed are four inches and a half in total length. The dark stripe along the dorsal line does not appear conspicuously here, but may be observed, as on all the others, more or less distinctly.

We have examined specimens collected in Milk River by Dr. Geo. Suckley, under Gov. I. I. Stevens, and in the Arkansas River near Fort Smith, by Dr. Geo. G. Shumard.

2. *HYBOGNATHUS EVANSI*.—May easily be distinguished from the preceding by a much stouter head, more protruding snout, small mouth, smaller eye. The opercle is as long as deep, subquadrangular, slightly emarginated behind, as in the rest of the species.

Collected at Fort Pierre, Nebraska, by Dr. John Evans.

3. *HYBOGNATHUS PLACITUS*.—The general aspect is shorter than in any of the preceding species. The snout is thickish, but less so than in *H. evansi*; the mouth smaller also. The eye is circular, its diameter being contained over four times in the length of the side of the head. The scales are also larger than in *H. evansi*. Greyish brown above, greyish silver along the middle of the flanks, and metallic white or yellow beneath.

Collected in the sluices of the Arkansas near Fort Makee; brought home by Lieut. E. G. Beckwith, U. S. A.

The fish described by Dr. Ayres, under the name of *Gila microlepidota*, presents such peculiarly shaped pharyngeal bones, that we did not hesitate erecting it into a distinct genus under the name of

ORTHODON,

in allusion to the erect form of its teeth. But to proceed more systematically: the head is subconical, attenuated towards the snout. The mouth is below the medium size, terminal, oblique, both jaws even; no barbels of any sort. A knob or tubercle upon the symphysis of the lower jaw, as in *Hybognathus*. Eye of medium size. Isthmus small. Body subfusiform, having the aspect of the *Gila*, but the ventrals are inserted under the anterior margin of the dorsal fin. The caudal is furcated. The scales are small; the lateral line submedial, being somewhat depressed along the middle of the abdomen. The pharyngeal bones are thin, vertically elevated, or rather broad in the vertical direction, bent as usual and widening towards the upper and inner limb, so as to be broadest there. The lower branch is much narrower. The teeth are of the cultriform kind of the grinding type, compressed, lanceolated, erect, very slightly bent inwards. They are disposed upon a single row of five, thus: 5—5, the upper ones being quite raised above the edge of the bone.

ORTHODON MICROLEPIDOTUS.—*Gila microlepidota*, AYRES, Proc. Cal. Acad. Nat. Sc. i. 1855, 21.

San Francisco, Cal.—Dr. Newberry.

The genus we next come to, and for which we have chosen the name of

ALGANSEA,

has features and characters altogether different from any known genus. The head is subconical, more or less pointed, though rounded upon its periphery. The mouth being of medium size, slightly oblique upwards, its angles never extending beyond the anterior rim of the orbit, and destitute of barbels; the jaws themselves terminate evenly. The eye is of moderate development.

There is a narrow isthmus between the gill openings. The body short and stoutish, quite compressed, covered with scales of medium or of large size, the lateral line being submedial, slightly deflexed upon the middle of the abdomen. The fins are rather moderate in development; the origin of the ventrals is situated opposite to the anterior margin of the dorsal, the posterior margin of the latter never reaching the anterior margin of the anal. The caudal fin is emarginated posteriorly. The pharyngeal bones are moderately strong; the upper and lower branches of nearly equal strength, though the lower is a little longer than the upper. The convexity is strongly marked and dilated. The teeth are of the cultriform kind of the grinding type, disposed upon a single row of four or five, as follows: 4—4 or 5—5. The uppermost stand boldly out above the surface of the bone.

1. *ALGANSEA TINCELLA*.—*Leuciscus tinella*, VAL. in Cuv. & Val. Hist. Nat. des Poiss. xvii. 1854, 323.—The scales in this species are next in size to those of *A. obesa*. There are about twelve rows beneath and fourteen above the lateral line. I say about, because the specimens are somewhat mutilated, as most market specimens are. The insertion of the ventrals are situated a little posteriorly to the anterior margin of the dorsal. The eye is smaller than in any of the preceding species of this genus. Reddish brown above, silvery on the sides, and white beneath.

Purchased in the city of Mexico by Major Wm. Rich.

2. *ALGANSEA BICOLOR*.—Of all the species hitherto known of this genus, the one here referred to has the largest scales, five rows of which may be counted from the origin of the ventrals to the lateral line, and nine from the lateral line to the anterior margin of the dorsal, in all fifteen rows. The ventrals are inserted a little in advance of the anterior margin of the dorsal. The body is thickest anteriorly, and tapers backwards; the nape is slightly swollen. The head enters about four times and a half in the total length. The back and sides are of a metallic bluish black, intermingled on the lower half of the flank with a golden hue. The inferior surface is white, contrasting with the color of the back.

Caught in Klamath Lake, O. T., by Dr. John S. Newberry, under Lieut. R. S. Williamson.

3. *ALGANSEA OBESA*.—A very corpulent species covered with scales of moderate development, and so far, the smallest in the genus. The depth is contained about three times in the length, caudal fin excluded. There are eight longitudinal rows of scales between the origin of the ventrals and the lateral line, and fourteen rows above it to the anterior margin of the dorsal, in all twenty-three rows. Dorsal region bluish grey; sides greyish; belly yellowish.

Specimens of this species were collected in the waters of Humboldt River by the late J. Soule Bowman and Lieut. E. G. Beckwith.

4. *ALGANSEA FORMOSA*.—A very graceful and well proportioned fish as regards body and head. The latter is rather slender and conical, constituting the fourth of the total length, in which the greatest depth enters nearly five times. The origin of the ventrals is situated under the anterior margin of the dorsal, as in *A. obesa*. The scales are next in size to those of *A. bicolor*. Seven rows are found between the origin of the ventrals and the lateral line, and ten above it, making eighteen rows in all. Metallic greenish brown above and on the sides, minutely dotted with black; beneath yellowish or whitish.

This species was collected in Mercede and Mohave rivers, by Dr. A. L. Heermann, under Lieut. R. S. Williamson, and is very closely allied to *Larinia gibbosa*, Ayres, but since I have no specimens of the latter, and that those before me measure but five inches and a half, I feel reluctant to attempt an identification.

Of all the genera recently established by Prof. Agassiz, there is none that has given me so much difficulty to understand, as his genus *Acrocheilus*.

The lengthy description appended to it, reminded me very forcibly of those "specific descriptions referring chiefly to individual peculiarities of specimens, a kind of portrait of peculiar individuals without much likeness." After a careful study of whatever specific there was in the description of *Acrocheilus alutaceus*, I came to the conclusion that *Acrocheilus* was identical with

LAVINIA,

published for the first time in 1854, nearly one year before *Acrocheilus* was proposed. Circumstances of that kind are always to be regretted on either side. The characters of the genus are as follows: The body is very much compressed, deep, subfusiform in outline, covered with well developed scales; the lateral line forming an open curve, convex downwards, nearer the abdominal outline than the back. The fins are well developed; the insertion of the ventrals are situated either in advance of the anterior margin of the dorsal, or immediately under it. The posterior margin of the dorsal approximates more or less the anterior margin of the anal. The caudal is deeply furcated, rounded upon its insertion, and provided with numerous well-marked rudimentary rays above and below. The head is rather small. The cleft of the mouth is situated altogether anteriorly to the orbit; it is of medium size, the upper jaw overlapping the lower one, which is either rounded or truncated upon its symphysis. There are no buccal barbels. The eye is of moderate size; a narrow isthmus separates the gill openings. The pharyngeal bones are strongly curved, the upper branch directed inwards and downwards, the inferior one slightly arched backwards, with the convexity dilated. The teeth, being of the cultriform kind of the grinding type, and disposed upon one single series of five, thus: 5-5, with a sharp terminal point.

1. *LAVINIA EXILICAUDA*, B. & G. Proc Acad. Nat. Sc. Phila. vii. 1854, 137. *Lavinia compressa*, Ayres, Proc. Cal. Acad. Nat. Sc. i. 1855, 21.

From Sacramento River, Cal.; collected by Dr. A. L. Heermann.

2. *LAVINIA ALUTACEA*.—*Acrocheilus alutaceus*, AGASS. & PICK. Amer. Journ. of Sc. 2d ser. xix. 1855, 99.

From Willamet Falls and Wallawalla river, collected by Dr. Charles Pickering, under Capt. O. Wilkes, U. S. N.

3. *LAVINIA HARENGUS*.—This species is intermediate between *L. exilicauda* and *L. alutacea*. The most characteristic feature consists in the relative position of the dorsal and anal fins, which are wider apart. Their size is nearly the same, and if any difference should be observable, the anal would be found a little larger than the dorsal. The specimens before us are in a mutilated condition, inasmuch as the scales are all fallen. The dorsal region seems to have been of a much deeper hue than the lower half of the sides, which are whitish, as well as the belly, contrasting with the rather dark hue of the dorsal region.

Caught at Monterey, Cal., by A. S. Taylor, Esq.

IV.

This fourth group is less uniform, if the teeth are taken into account. The latter belong to the hooked types, with or without grinding surface (*Dentes uncinato-submolares* and *uncinato-subconici*), of the raptorial (*Dentes raptatori*) and prehensile (*D. prehensiles*), kinds chiefly; in most cases disposed upon a double series. But all its representatives are provided with buccal or maxillary barbels. In the species from the Pacific range a thin cartilaginous pellicle is observed upon the jaws: illustrating what we had already remarked, that the cartilaginous lips are not sufficient to characterise the group of *Chondrostomi*. Of course, it is in the latter where that character assumes its greatest development.

We begin the group with the genus

ARGYREUS, Heck.

which is the exact synonym of Agassiz's *Rhinichthys*. And we are not a little surprised at seeing the learned Professor bring forward his generical appellation,* introduced into the nomenclature in 1850, in preference to that of Heckel instituted in 1840, especially when elsewhere he appears so eager at restoring all such names as have the priority of publication, and which is nothing but just.

The natural characters of the genus *Argyreus*, are: "A snout more or less protruding beyond the lower jaw, thus giving the mouth an inferior position." In that respect it resembles *Campostoma* and similar *Chondrostomi*. "The mouth itself is rather small, surrounded with quite narrow and smooth lips," covered with a deciduous cartilaginous pellicle in the western species, "and provided upon its angle with a small barbel, sometimes very conspicuous." The gill openings are separated beneath by a very wide isthmus. The insertion of the ventrals is situated in advance of the anterior margin of the dorsal fin, which is higher than long. The caudal is furcated. The scales are small. The pharyngeal bones are quite narrow, and stouter above than below. The teeth are of the hooked type without grinding surface, strongly hooked and disposed thus: 1 | 4—4 | 2, that is, upon two rows, four in the outer row, and one or two in the inner row.

The following species have already been mentioned :

1. *ARGYREUS ATRONASUS*, Heck.—See STORRS, Hist. of Fish. of Mass. in the Mem. of the Amer. Acad. new ser. vol. v. 1855.

2. *ARGYREUS NASUTUS*, Grd.—See STORRS, Hist. of Fish. of Mass. in the Mem. of the Amer. Acad. v. 1855.

3. *ARGYREUS MARMORATUS*.—*Rhinichthys marmoratus*, AGASS. Lake Sup. 1850, 354, Pl. II. figs. 1 and 2.

From Sault St. Mary.—L. Agassiz.

4. *ARGYREUS OBTUSUS*.—*Rhinichthys obtusus*, AGASS. Amer. Journ. of Sc. 2d. ser. xvii. 1854, 357.

From Tennessee River.

5. *ARGYREUS MELAGRIS*.—*Rhinichthys melagris*, AGASS. Amer. Journ. of Sc. 2d. ser. xvii. 1854, 357.

From Iowa.

To which we add, as new :

6. *ARGYREUS DELTOID*.—It has the snout more prominent than *A. atronassus*, and less so than *A. nasutus*. The head is well developed, constituting the fourth of the length, the caudal fin excluded. The eye is quite small and subcircular, its horizontal diameter entering six times in the length of the side of the head, a little over twice in advance of its anterior rim. The mouth is larger than in most of its congeners, and the barbel much more conspicuous. The dorsal fin, as usual, is higher than long, but its upper margin is slightly convex. Its anterior margin is nearer the extremity of the snout than to the insertion of the caudal fin. The latter constitutes a little less than the fifth of the entire length. The anal is a little shorter than the dorsal, but not as deep as the latter is high.

D 10 : A 9 ; C 4, 1, 9, 8, 1, 5 ; V 8 ; P 13.

The dorsal region is greyish yellow ; the sides yellowish, with an indistinct silvery band ; beneath yellowish white. The dorsal region, including the upper part of the flanks, is spread over with black specks, sometimes observed beneath the silvery band also.

Specimens, the largest of which measuring about three inches and a half, were collected by the late J. S. Bowman, in the Sweet Water, a tributary stream

* Amer. Journ. of Sc. 2d. ser. xvii. 1854, 357.

of Nebraska, or Platte River. Smaller specimens of the same species were obtained in Cottonwood Creek, Utah, by Lieut. E. G. Beckwith, U. S. A.

7. *ARGYREUS NUBILUS*.—This is a very characteristic species. The head is very small, and the body, fusiform in shape and compressed, is thick and swollen upon its middle. The tail again is rather slender. The snout is subconical, but not more protruding than in the preceding species; the mouth is a great deal smaller than in the latter, with its barbels less conspicuous. The head constitutes about the fifth of the entire length. The eye is moderately developed and subcircular in shape; its horizontal diameter is contained about five times in the length of the side of the head. The dorsal, caudal and anal fins are of but moderate development, the pectorals and ventrals rather small.

D 8+2; A 7+2; C 5, 1, 9, 8, 1, 6; V 8; P 12.

The number of rays in the fins does not materially differ from that of the preceding species; in both, the anterior two rays of the dorsal and anal fins are mere rudiments.

The color above is blackish brown, with a purplish hue along the middle of the flanks; the inferior regions are of a soiled white or yellowish brown. The upper surface of the head and upper half of the sides, including the eye, is deep black; inferiorly it is whitish or yellowish white.

Specimens, four inches in total length, were collected at Fort Steilacoom, Puget Sound, W. T., by Dr. Geo. Suckley, U. S. A., under Gov. I. I. Stevens.

8. *ARGYREUS OSOULUS*.—Has more the fascies of *A. atronotus* than of any other of its congeners, both by the outline of its body and head, and the shape and position of the mouth. The head is comparatively small, forming the fifth of the length, with the exception of the lobes of the caudal. The eye is rather large and subcircular, its diameter entering about four times in the length of the side of the head. The dorsal and anal fins are well developed, the former being convex superiorly, and the latter subconvex exteriorly. The posterior margin of the caudal is crescentic. The posterior extremity of the ventrals extend as far as the vent, which is not the case in the two species described above.

D 8+2; A 7+2; C 5, 1, 9, 8, 1, 6; V 8; P 14.

The anterior two rays of both the dorsal and anal fins are mere rudiments, as already stated.

The color is reddish brown above; olivaceous on the sides, with numerous dark blotches and dots. Beneath uniform yellowish white or silvery white.

Many specimens, the largest of which measuring less than three inches, were collected by John H. Clark, under Col. J. D. Graham, U. S. A., in the Babocomori, a tributary stream of the Rio San Pedro, itself flowing into the Rio Gila.

9. *ARGYREUS NOTABILIS*.—This species resembles *A. osculus* in many respects, but will always be easily distinguished from it by a more truncated snout, and consequently by a mouth not so deeply cleft. The dorsal fin is situated more anteriorly also. The scales are smaller. The ground color is yellowish or brownish above, golden or orange beneath, covered all over, the abdominal region excepted, with small black spots.

Specimens caught in the Rio Santa Cruz, Sonora, by John H. Clark, under Col. J. D. Graham, U. S. A.

The hydrographic basin of the Rio Gila harbors a generic type which, at first sight, one would refer to *Argyreus*; but on a closer inspection, its generic traits will appear quite conspicuous. The name of

AGOSIA

is proposed for it; the diagnosis is as follows: Snout rounded, slightly protruding beyond the lower jaw, though the mouth opens horizontally. The mouth is of medium size, surrounded with narrow and smooth lips, and provided upon its angle with a very small barbel. The isthmus is of moderate width. The insertion of ventrals is situated opposite the anterior margin of dorsal fin, which is higher than long. The caudal is bifurcated. The scales are minute.

The pharyngeal bones are expanded upon their curvature. The teeth are of the prehensile kind of the hooked type, provided with a grinding surface; strongly hooked, and disposed thus: 4—4, that is, upon one single row of four.

Now, comparing the above with the characters assigned to *Argyreus*, we find that the most prominent difference resides in the pharyngeal teeth. The isthmus is narrower, and the insertion of the ventrals placed further back.

1. *AGOSIA CHRYSOGASTER*.—is about three inches and a half in total length, the head forming a little more than the fifth of it. The posterior extremity of the maxillary extends to the vertical line of the anterior rim of the orbit. The eye is large and circular, its diameter being contained about four times in the length of the side of the head. The anterior margin of the dorsal is a little nearer the end of the snout than the insertion of the caudal. The following is the formula of the fins:

D 10; A 7; C 4, 1, 9, 8, 5; V 9; P 16.

A minute rudiment at the anterior margin of both the dorsal and the anal fins are not included in the above numbers.

The region above the middle of the flanks is reddish brown, spotted or dotted with black, especially upon the head; a black vitta separates this region from that beneath, which is unicolor of a golden hue.

The species was collected in the Rio Santa Cruz, Sonora, by John H. Clark, under Col. J. D. Graham.

2. *AGOSIA METALLICA*.—The specimens of this species are a little shorter than those of the preceding one. It is very characteristic, and easily distinguished from its congener. The head is shorter and the snout more abruptly rounded. The eye is smaller also. The body is more gracefully subfusiform and compressed. The dorsal is higher and narrower, rounded superiorly. The posterior margin of the caudal is crescentic, less furcated than in *A. chrysogaster*.

The formula of the fin's rays present also some difference:

D 9; A 8; C 4, 1, 9, 8, 1, 5; V 8; P 15.

The same is true with regard to the rudiment at the anterior margin of the dorsal and anal, and which must be sought for under the skin.

Upper regions greyish brown dotted with black; inferiorly silvery and unicolor; a black vitta on the sides separating the two hues.

Collected by John H. Clark, under Col. J. D. Graham, U. S. A., in the Rio San Pedro, an affluent of the Rio Gila.

The genus which we have formerly characterized under the name of

POGONICHTHYE,

although enlarged by the accession of a new species, stand within the same limits as were originally assigned to it. The body is fusiform and elongated, compressed, covered with large and uniform scales, and provided with a conspicuous lateral line deflexed upon the middle of the abdomen. The dorsal fin is higher than long; the ventrals are inserted in advance of the anterior margin of the dorsal. The caudal is bifurcated. The head is of moderate size or else small, either rounded or flattened upon its upper surface. The snout being more or less protruding beyond the lower jaw, the mouth assumes a somewhat inferior position, although opening horizontally forwards. The mouth itself is of medium size, provided upon its angle with a barbel inserted upon the anterior edge of the posterior extremity of the maxillary. The eye is of moderate development. The isthmus is quite narrow. The pharyngeal bones are proportionally stout, the inferior limb being, however, slender, slightly arched and expanded upon its symphysis. About the height of the third tooth the convexity suddenly expands, tapering off towards the extremity of the upper branch, which is slightly bent inwardly downwards. The teeth are well developed, very much compressed upwards and hooked. They are of the prehensile kind, of the hooked type, with a grinding surface, somewhat inclined backwards, and disposed upon a double row of two and four: 2 | 4—4 | 2.

This genus is intimately related to *Leucosomus*, differing from it chiefly, by the structure of its teeth, which are provided with a grinding surface in *Pogonichthys*, whilst there is a sharp edge in *Leucosomus*.

1. *POGONICHTHYS INÆQUILOBUS*, B. & G. Proc. Acad. Nat. Sc. Philad. vii. 1854, 136.

Besides the specimens collected by Dr. Heermann in the San Joaquin River, Cal., we have received others from Petaluma, Sonoma County, Cal., collected by E. Samuels.

2. *POGONICHTHYS SYMMETRICUS*, B. & G. Proc. Acad. Nat. Sc. Philada. vii. 1854, 136.

From Fort Miller, San Joaquin Valley, Cal.; collected by Dr. Heermann.

3. *POGONICHTHYS ARGYREIUS*, Girard, Proc. Acad. Nat. Sc. Philada. vii. 1854, 153.

Collected at Presidio, near San Francisco, Cal., by Lieut. W. P. Trowbridge, U. S. A.

4. *POGONICHTHYS COMMUNIS*.—This species is the most characteristic of the genus, by its small and flattened head and the large scales which cover the body. The mouth is larger in proportion than in any of its congeners; in large specimens the snout overlaps entirely the lower jaw, in which respect it resembles *Gila elegans* most remarkably. The barbel upon the angle of the mouth is very conspicuous. The fins are all well developed; the external rays of the pectorals extend beyond the usual termination of these fins in other species. The dorsal region is reddish grey or greyish red, according to circumstances; the rest of the body whitish yellow or yellowish golden, the fins being unicolor.

We have examined numerous specimens of this species. They were collected at Fort Pierre, Nebr., by Dr. John Evans; at Fort Union, by E. J. Denig; above Fort Union and in Milk River, by Dr. Geo. Suckley, under Gov. I. I. Stevens; in the Yellowstone River, by Dr. F. V. Hayden, and in the Sweet Water, a tributary of Platte or Nebraska River, by the late J. Soule Bowman.

The genus of genuine Gudgeons,

Gobio, Cuv.

is a type that may easily be characterized. Head subconical, with the snout rather thick and obtuse, overlapping the lower jaw, thus giving the mouth a somewhat inferior position. The latter, however, is directed forwards; it is large, and provided with a well developed barbel upon the posterior extremity of the maxillary. The eye is of moderate development. The isthmus is large. The body is elongated, subcylindrical. The dorsal and anal, both, are rather narrow fins. The insertion of the ventrals takes place under the anterior margin of the dorsal or a little behind it. The caudal is bifurcated. The scales are large and the lateral line nearly median. The pharyngeals are gracefully curved, the upper and lower branches tapering, the convexity very slightly expanded. The teeth are slender, subcylindrical upon their base, compressed above, of the raptorial kind of the hooked type, without grinding surface, and disposed upon a double series of one, two or three, and three, four or five, as follows: 3 | 5—5 | 2, or 2 | 4—4 | 1, &c. &c.

This genus may be distinguished from *Leucosomus* by its protruding snout, much more developed maxillary barbel, and narrow dorsal and anal fins, and finally its pharyngeal teeth more strongly hooked.

1. *Gobio ONLIDUS*.—Body and head very slender and elongated; head forming about the fifth of the total length. The snout is quite prominently developed. The eye is rather small compared to *G. fluviatilis*, resembling more, in that respect, *G. cataractæ*, from which, however, this species can readily be distinguished by the position of its ventral fins, which are inserted under the anterior margin of the dorsal, whilst they are placed in advance of it in *G. cataractæ*.

Color yellowish brown, lighter beneath than above, with a silvery streak along the middle of the flank.

Specimens of this species were collected in Milk River, an affluent of the upper Missouri, by Dr. Geo. Suckley, under Gov. I. I. Stevens.

2. *Gobioestivalis*.—This is quite a characteristic species, differing from all its congeners by a rather compressed body, elevated and arched upon its middle, and tapering rapidly along the peduncle of the tail. The snout is much shorter and less obtuse than in *G. gelidus*; the eye is larger also, and the position of the ventrals a little more forwards. The scales are larger, too. In coloration we see no marked difference between this species and *G. gelidus*.

Caught in the Rio San Juan, near Cadereita, New Leon, by Lieut. D. N. Couch, U. S. A.

3. *Gobio vernalis*.—The body is fusiform, thickest anteriorly, tapering posteriorly. The head is short, the snout blunt and rounded. The eye is large, its diameter being contained three times and a half in the length of the side of the head. The caudal fin is long and deeply furcated; it constitutes nearly the fourth of the entire length, whilst the head enters in the latter nearly five times and a half. The color is uniform yellowish brown, with a silvery streak along the middle of the flanks. The opercular apparatus and cheek are highly silvery.

From Arkansas River, near Fort Smith; collected by Dr. Geo. G. Shumard.

Under the head of *Luxilus* will be found the reasons for transferring the name of

LEUCOSOMUS, Heck.

to *Leuciscus pulchellus*, instead of *Cyprinus chrysoleucus*. We shall now characterize this genus, as it is, henceforth, to stand in the ichthyic system. The body is elongated, subfusiform, compressed. The head is stout, conical, either abruptly truncated or tapering off. In either case, the mouth is large, subterminal, and the upper jaw slightly protruding beyond the lower. A small barbel upon the maxillary, near the angle of the mouth. Eyes of medium size. Insertion of ventrals a little in advance of the anterior margin of the dorsal, or immediately under it. Caudal bifurcated. Scales large, a little longer than high; lateral line following the middle of the flanks. Pharyngeal bones stoutish, sickle-shaped; the inferior branch rather slender, the convexity having a slight expansion tapering off towards the tip of the upper branch. The teeth are subconical, compressed and strongly hooked, of the raptatorial kind, of the hooked type, without grinding surface. They are disposed upon a double row of four and two in the following manner: 2 | 4—4 | 2; sometimes 2 | 5—4 | 3, and even 1 | 4—4 | 2.

The genus *Cheilonemus*, Bd., is strictly synonymous with *Leucosomus*; the latter differs from *Semotilus* by the presence of maxillary barbels.

1. *LEUCOSOMUS PULCHELLUS*.—*Leuciscus pulchellus*, STORER, Rep. 1839, 91.—*Leuciscus argenteus*, STORER, Rep. 1839, 90.—*Leucosomus chrysoleucus*, HECK., in Russ. Reise. ii. 1843, 1042, pl. i. *Leuciscus storeri*, VAL., in Cuv. & Val., Hist. Nat. Poiss. xvii. 1844, 319.—*Cheilonemus pulchellus*, GRD., in Storer, Fish. of Mass., in Mem. Amer. Acad. v. new ser. 1855, 120, pl. xxii., fig. 2.

Inhabits the fresh waters of New England.

2. *LEUCOSOMUS PLUMBEUS*.—*Gobio plumbeus*, AGASS., Lake Sup. 1850, 366.—If at all different from the preceding, this will be a second species of the genus. Lake Huron and Lake Superior.

3. *LEUCOSOMUS DISSIMILIS*.—This species will be easily recognized by the small size of the scales of the back compared to those of the flanks. In that respect it approximates species of the genus *Semotilus*. Its head is subconical, contained a little less than four times in the total length. The eye is large, its diameter being contained four times in the length of the side of the head. The color is

uniform greyish brown above, silvery along the middle of the flank and yellowish beneath.

Specimens of this species were collected by Dr. Geo. Suckley, under Gov. I. I. Stevens, in Milk and Little Muddy rivers, tributaries of the upper Missouri.

4. *LEUCOSOMUS PALLIDUS*.—This species has the same general physiognomy as *L. dissimilis*. The scales of the back are likewise a great deal smaller than on the flanks, but in *totum* they are larger than in the preceding species. The origin of the ventrals is situated in advance of the anterior margin of the dorsal, a feature that will enable us at once to discriminate between this species and *L. dissimilis*. The dorsal region is greyish brown, the ventral region yellowish white. A black spot at the base of the caudal, as well as upon the anterior margin of the dorsal.

Specimens were collected in Antelope Creek, Arkansas, by Dr. C. B. Kennerly, under Lieut. A. W. Whipple, U. S. A.

5. *LEUCOSOMUS INCRASSATUS*.—Remarkable for its stout and short body and well developed head, which constitutes a little more than the fourth of the total length. The scales are proportionally smaller than in *L. pallidus*. Dark greyish above, light greyish beneath, with a yellowish hue all over the head and body. A black spot upon the anterior margin of the dorsal; none upon the caudal.

Collected twenty miles west of Choctaw Agency, by H. B. Möllhausen, under Lieut. A. W. Whipple, U. S. A.

The following genus, for which the name of

NOCOMIS

is thought well appropriated, has a short, stoutish and compressed body, covered with large scales. The ventrals are inserted opposite the anterior margin of the dorsal, mayhap a little anterior to it. The caudal is furcated. The head is large, rounded upon the snout, which is declivous. The mouth is large and terminal, the lower jaw being slightly overlapped by the upper. A barbel upon the posterior extremity of the maxillary. Eyes small. Isthmus rather wide. The pharyngeals are stoutish, somewhat expanded upon their convexity; expansion tapering off towards the tip of the upper limb, which is gently curved inwards. The inferior limb is scarcely longer than the upper, looks more slender, is flattened upon its extremity, which is turned outwards, causing a convexity inwardly. The teeth are of the voratorial kind of the hooked type, without grinding surface. They are subcylindrical, acerated and hooked, disposed upon a double series of one and four, in the following manner: 1 | 4—4 | 1.

This genus is allied to *Semotilus* by its pharyngeal teeth, differing chiefly by its mouth, which is not so deeply cleft, and by its maxillary barbels, which are absent in *Semotilus*.

NOCOMIS NEBRACENSIS.—It is a fish about four inches in total length, of a uniform reddish brown hue above, and golden yellow beneath; a blackish streak along the middle of the flanks terminating into a black spot upon the base of the caudal fin. The lateral line is nearly medial, being but slightly depressed along the thoracic region.

Collected in the Sweet Water, a tributary of Platte or Nebraska River, by the late J. Soulé Bowman.

V.

The genera brought together in this paragraph are numerous, and quite as varied in their dentition as in the former group. They differ from the latter by the absence of barbels. As in the preceding, the teeth are of the hooked type, with or without grinding surface (*Dentes uncinato-submolares et uncinato-subconici*), mostly of the raptorial kind. In the majority of cases, the teeth are disposed upon a double series also.

This and the former group ought to be subdivided in a natural method, which is not our object now. Moreover, a thorough grouping of the American Cypr-

noids cannot yet be attempted with any sort of satisfaction, as long so the eastern representatives are not all revised.

The most curious genus, it must be conceded, is that of

Exoglossum, Rafn.

The body is elongated, subcylindrical, slightly compressed. The head is subconical, flattened upon the occiput, and terminated by a blunt snout. The mouth is subterminal, opening downwards and forwards, the lower jaw being shorter than the upper and not surrounded by the lips around its symphysis, the lips being largely developed at the angle of the mouth and along the upper jaw also. The eye is of moderate size. The isthmus is wide. The origin of the ventrals is situated opposite the anterior margin of the dorsal. The caudal is bifurcated. The scales are of medium size, nearly quadrilateral. The pharyngeal bones are exiguous, very slender upon their inferior branch, hardly dilated above. The teeth are of the raptatorial kind of the hooked type, without grinding surface, instead of which a sharp, but not crenated, edge. They are disposed upon a double row of one and four, thus: 1 | 4—4 | 1.

1. *EXOGLOSSUM MAXILLIGUA*, Hald. in *Rupp*, Hist. of Lanc. Co., Pa., 1844, 474.—AGASS. Amer. Journ. of Sc. 2d Ser. xix. 1855, 215.—*Cyprinus maxillingua*, Lesau., Journ. Acad. Nat. Sc. Philada. i. 1817, 85.—*Exoglossum lesucurianum*, Rafn., Journ. Acad. Nat. Sc. Philada. i. 1818, 420.

Prof. Haldeman was the first who thought of restoring the name of *maxillingua* to this species.

2. *EXOGLOSSUM MIRABILE*.—A very characteristic species, very slender and fusiform, and distinguished from the preceding by a smaller head, smaller mouth, the position a little more backwards of the ventrals, and larger scales. The color is reddish brown above, light reddish beneath, with a silvery band along the middle of the flanks from head to tail. A black spot upon the insertion of the caudal fin.

Caught in the Arkansas River, near Fort Smith, by Dr. Geo. G. Shumard.

Along with young specimens of *Gila grahami*, caught in the San Pedro, were numerous little fishes from two and a half inches to three inches long, which, upon a superficial examination, might not have been distinguished from their associates just mentioned, for the fact of the absence of scales could not have given them an aspect very different from the young *Gilæ*, since the latter have very minute scales in their immature state. A careful comparison between the two sets of specimens very soon revealed generic characters so peculiar, that we had to institute, under the name of

MEDA,

a genus widely different from all other American cyprinoids, by the presence, upon the anterior margin of the dorsal, of a stout undivided (though articulated) ray, resembling in its general appearance that which is observed in *Barbus*, *Lucio-barbus*, *Scaphiodon* and *Systomus*, differing, however, from all of these in the structure of its posterior edge, which is grooved instead of being serrated. The absence of buccal barbels in *Meda*, is another feature to warrant its claims as a genus, which differs from *Cyprinus*, *Cerassius*, *Carpio*, &c., by characters equally obvious, as will be seen by the following diagnosis:

Body elongated, slender, compressed, fusiform in its profile, and perfectly naked. The lateral line may be traced along the middle of the flanks, slightly deflexed upon the abdomen. The head is elongated, subconical, rounded upon the snout without being truncated. The mouth is proportionally large, subterminal, its cleft slightly oblique upwards, the lower jaw fitting into the upper. No barbels. The eye large and circular. The isthmus narrow. Dorsal fin higher than long, provided anteriorly with a stout, articulated but simple and osseous ray grooved posteriorly and nearly as high as the second ray, which is

slightly higher, and the highest of all. The ventrals are inserted in advance of the anterior margin of the dorsal, and adherent to the ventral line for more than the half of their total length. The caudal is deeply furcated. The pharyngeal bones are slender, especially upon their inferior limbs, which are longer than the upper ones. The latter are flattened or expanded, and curved inwardly downwards. The teeth are very slender, subconical, compressed at their base, of the prehensile kind of the hooked type, without grinding surface. They are disposed upon a double series of one and four: 1 | 4—4 | 1. Thus, equally distinct from both *Phoxinus* and *Phoxinellus*, to which this genus bears an external resemblance.

Thus far we are acquainted with but one species.

MEDA FULGIDA.—The head constitutes a little more than the fifth of the total length. The angle of the mouth is even with a vertical line drawn in advance of the orbit. The dorsal region is reddish yellow; the middle of the flanks as if painted with silver; underneath pale yellow.

From Rio San Pedro, tributary of the Gila; collected by John H. Clark, under Col. Graham, U. S. A.

We now bring here together, under the name of

CLIOLA,

some species of small cyprinoids, having the external aspect of *Diionda*, but differing from the latter by the pharyngeal teeth, which are curved, and without grinding surface. The snout is rounded, the mouth small and terminal, with both jaws equal. There is a rather wide isthmus. The eyes are well developed, also. The dorsal fin is about as long as high, or longer than high. The caudal fin is bifurcated; the insertion of the ventrals, opposite the anterior margin of the dorsal. The scales being large, and the lateral line following the middle of the flanks. The pharyngeal bones are of moderate strength; the inferior branch is rather slender, and nearly straight when viewed in front; from the insertion of the teeth, they gradually expand to the entire convexity which is gentle and gradual. The teeth themselves are of the raptatorial kind, of the hooked type, without grinding surface, compressed, curved, and disposed upon one single row of four: 4—4.

1. **CLIOLA VIGILAX.**—*Ceratichthys vigilax*, B. & G., Proc. Acad. Nat. Sc. Phila. vi. 1853, 390.—*Leuciscus vigilax*, B. & G., in *Marcy's Expl. of Red Riv. of La.* 1853, 248. Zool. Pl. xxiv. figs. 1—4.

From Otter Creek, a tributary to the northern fork of Red River, Ark.

2. **CLIOLA VELOX.**—A very slender and elegant species, differing from *C. vigilax*, by a more conical head, much larger eyes, and larger scales. A black spot may be observed upon the anterior margin of the dorsal fin. The ground color is olivaceous, with the middle of the flanks silvery; a black vitta follows the course of the lateral line. A black spot exists also upon the base of the caudal fin.

Specimens were collected by Dr. O. B. Kennerly, under Major W. H. Emory, in the San Pedro creek, a tributary of the Rio San Antonio, Texas.

3. **CLIOLA VIVAX.**—This species might easily be mistaken for *C. velox*, were it not for the shortness of its head and its small eye. Besides, the body is not so much elongated, and is covered with scales a great deal smaller. The color is uniform light yellowish or saffron, with a black spot upon the base of the caudal fin, and another upon the anterior margin of the dorsal; the middle of the flanks exhibits traces of a greyish or blackish vitta.

Caught in Leon River, a tributary to the Rio San Antonio, Texas, by Dr. C. B. Kennerly, under Lt. A. W. Whipple, U. S. A.

Amongst the few genera which seem to be common to both hemispheres, there is the genus

ALBURNUS, Rond.

which we find distributed over a large portion of our continent. But, in order to include the American species in that genus, the diagnosis is to be slightly modified, so as to read: Raptorial teeth disposed upon a double row of two and four or five, thus: 2 | 5—5 | 2 or 2 | 4—4 | 2. In all the species which I have examined, the teeth are disposed according to the second formula.

The teeth themselves are slender and compressed, more or less hooked. The pharyngeal bones are slender, expanded upon their convexity, the upper limb bent inwards and downwards, and the inferior limb rather exiguous and shorter than the upper. Should the American species, now referred to this genus, prove generically distinct upon a more minute comparison, which we cannot now establish, the name of *ALBURNELLUS* might unite them under a new generic appellation.

1. *ALBURNUS DILECTUS*,—is about three inches and a half in total length; the head forming a little less than the sixth part of it. The greatest depth is nearly equal to the length of the head. The diameter of the circular eye is contained a little more than three times in the length of the side of the head, and less than once in advance of its anterior rim. There are ten longitudinal rows of scales between the insertion of the ventrals and the base of the dorsal. The lateral line is upon the fourth row from the ventrals upwards. The color is uniform yellowish red with a lateral silvery streak.

Collected in the Arkansas river near Fort Smith, by Dr. Geo. G. Shumard.

2. *ALBURNUS UMBRATILIS*,—is a shorter and deeper species, and which might easily be taken for a *Luridus*, so striking is its general resemblance with small specimens of the latter genus. The greatest length is about three inches; the greatest depth being equal to the length of the head, and contained five times in the total length. The lateral line, though running along the fourth row of scales from the insertion of the ventrals, is more deflexed upon the abdomen than in *A. dilectus*; the longitudinal rows of scales being fourteen in number. The ground color is silvery grey above; the back, sides and fins as if shaded; the belly reddish.

Specimens were collected, by H. Möllhausen, in Sugar Loaf Creek, a tributary to Poteau river, flowing into the Arkansas near Fort Smith.

3. *ALBURNUS AMABILIS*—This is a very slender and graceful species, about two inches and a half in total length. The head constitutes the fifth of the length, and the greatest depth, the sixth. There are nine longitudinal rows of scales upon the flanks, between the insertion of the ventral fins and the dorsal line. The lateral line, as usual, is found along the fourth row from the ventrals upwards. The color is dark reddish brown, silvery upon the flanks. A black patch upon the base of the tail.

Specimens were collected in the Rio Leona, an affluent of the Rio Nueces, by John H. Clark, under Col. J. D. Graham, U. S. A.

4. *ALBURNUS MEGALOPS*.—Resembles *A. amabilis* in general traits, being slender and graceful, but easily distinguished from it by a shorter and more rounded snout and a larger eye. The coloration is the same with the exception of the black caudal patch, which does not exist here. The average size of the specimens before us is about two inches.

Caught in San Felipe Creek, Texas, by John H. Clark, under Col. Graham.

5. *ALBURNUS SOCIUS*.—Resembles *A. megalops* by its snout and eye. The total length is two inches and a half, the head forming the fifth part of it. The greatest depth is a little less than the length of the head. The dorsal region is olivaceous, the flanks silvery, and the belly yellowish. Opercular apparatus golden.

Specimens of this species were collected in Live Oak Creek, Texas, by John H. Clark, under Col. J. D. Graham, U. S. A.

There are yet other species which bear a striking external resemblance to *Alburnus*, or better *Alburnellus*, but differing by an ensemble of characters, which have led us to establish, under the name of

ALBURNOPS,

a genus to include them. They may be distinguished by their smaller mouth and by a thickening of the snout, which slightly overlaps the lower jaw, contrary to what is the case in *Alburnus* and *Alburnellus*. In that respect, *Alburnops* will remind us some species of *Hyborhynchus*. The eye is large; a very narrow isthmus separates the gill apertures beneath. The insertion of the ventrals takes place under the anterior margin of the dorsal fin, which resembles that of *Alburnus* and *Alburnellus*.

In both of the latter genera, the ventrals are situated in advance of the dorsal. The caudal is furcated. On the other hand, the anal has a narrower base than in *Alburnus* and *Alburnellus*; the lateral line is nearly medial, instead of being deflexed upon the abdomen. The scales are large and deciduous. The pharyngeal bones resemble, by their configuration, those of *Alburnellus*. The teeth themselves, are of the prehensile kind of the hooked type, with a narrow and sometimes contorted grinding surface. They are disposed upon a double row of two and four: 2 | 4—4 | 2, or 1 | 4—4 | 2.

Thus we see that a marked difference between *Alburnops* and *Alburnus* s. *Alburnellus*, consists in the presence of a grinding surface in the former, and which is absent in the latter.

1. *ALBURNOPS BLENNIUS*.—This species has the snout most prominently rounded. The posterior extremity of the maxillary extends to a vertical line drawn across the anterior rim of the orbit. The eye is smaller than in the two following species. The greatest length being about three inches and a half, the head forming the fifth part of it; the depth is less than the length of the head. There are ten longitudinal rows of scales upon the greatest depth, six above the lateral line and three below it. The color is reddish brown; the middle of the flanks, silvery; the fins unicolor.

Specimens collected in the Arkansas river, near Fort Smith, by Dr. Geo. G. Shumard.

2. *ALBURNOPS SHUMARDI*.—The snout is more conical than in the preceding species, the mouth larger and more deeply cleft. The head constitutes, likewise, the fifth of the total length, which measures three inches and a half. There are but nine rows of scales, five above and three below the lateral line. Color reddish brown; flanks silvery.

Collected by Dr. Geo. G. Shumard, in the Arkansas river, near Fort Smith.

3. *ALBURNOPS ILLINOEBROSUS*.—Perhaps the most graceful of the three species so far known of this genus. The number of rows of scales is ten, as in *A. blennius*. The snout less prominent than in *A. shumardi*, and more so than in *A. blennius*. The eyes are the largest in the genus. The head is contained five times and a half in the total length, which averages about three inches. Color reddish brown; flanks silvery.

Caught in the Arkansas river, near Fort Smith, by Dr. Geo. G. Shumard.

Under the name of

CODOMA,

we arrange small cyprinoids, characterized by a short head and rounded snout, terminated by a small mouth, the cleft of which does not reach a vertical line drawn in front of the orbit; there being no barbels at its angle, and both jaws even. The isthmus is of moderate width. The body is more or less elongated, compressed. The insertion of the ventrals is situated in advance of the anterior margin of the dorsal. The caudal is bifurcated, and like the rest of the fins, rather

small. The scales are of medium size, higher than long, and the lateral line is but slightly deflexed upon the thoracic region. The pharyngeals are moderately expanded upon their convexity. The teeth are of the raptorial kind, of the hooked type, compressed, without grinding surface, instead of which, a sharp, but not serrated ridge. They are arranged upon one single row of four, thus: 4—4.

The general physiognomy of the genus reminds us of that of *Pimphales* and *Cochlognathus*, with which genera it has no intimate affinities, when the pharyngeal dentition is taken into consideration. Indeed, its affinities with *Cyprinella* and *Moniana* are of a more close character, for the teeth are constructed according to the same general pattern; from *Cyprinella*, however, it differs by the presence of one single row of teeth, and from *Moniana* by the absence of serratures upon the cutting edge of the teeth, and finally from both *Cyprinella* and *Moniana* by smaller scales, the course of the lateral line, and the short and rounded head.

1. *CODOMA ORNATA*.—This species has the aspect of *Pimphales promelas* to a much higher degree than the following. The head forms the fifth of the total length, whilst the greatest depth enters in the latter but three times and a half. The eye is circular and well developed; its diameter entering a little over three times in the length of the side of the head. The anterior margin of the dorsal is a little nearer the extremity of the snout than to the insertion of the caudal fin.

D 8 + 1; A 7 + 1; C 6, 1, 9, 8, 1, 6; V 7; P 12.

The coloration is rich and profuse, the upper regions are purplish black, with transverse bands of the same hue along the flanks to the base of the caudal fin; the space not occupied by these, on the back as well as on the abdomen, is of a golden red. The fins are purplish black, edged or tipped with golden yellow or pure white.

Inhabits Chihuahua river and its tributaries; collected by John Potts, Esq.

2. *CODOMA VITTATA*.—Has a more elongated body and subfusiform outline than the preceding species. The head forms a little less than the fifth of the entire length, whilst the depth enters in it about four times and a half. The eye is much smaller than in *C. ornata*; the fins and scales are smaller, also.

D 8 + 1; A 7 + 2; C 7, 1, 9, 8, 1, 6; V 7; P 14.

The upper regions are purplish brown; a silvery band along the middle of the flank; inferiorly yellowish orange. Fins unicolor; the superior ones greyish, the inferior yellowish.

Collected in the valley of Mexico, by John Potts, Esq.

Since Rafinesque's genera are to be restored, his genus

PLAGGYRUS,

is to take the precedence over the genus *Hypoclinemus* of more modern coining. The name of *Plaggyrus* was provided for in the *Ichthyologia ohioensis*, to replace that of *Rutilus* in the eventuality that *Cyprinus rutilus* of Europe, which was the type of the genus *Rutilus*, should prove generically distinct from *Rutilus plaggyrus* and similar American species, and which is the case.

The genus *Plaggyrus* includes the prettiest species of American Cyprinoids. Their comparatively small size, compressed and graceful body, subfusiform in its profile, added to brilliant and vivid colors, have brought these fishes to the notice of the multitude. They are commonly known as "Red Dace," "Silver-side Fall-fish," "White and Yellow-winged Shiner," "Shiner," &c.

Its generic traits may be thus expressed: Head large and subconical; mouth terminal, more or less oblique upwards. Jaws equals. No cirrhi or barbels. Eyes large. Isthmus quite narrow. Tail tapering. Caudal fin bifurcated or forked. The insertion of the ventrals is situated opposite the anterior margin

of dorsal fin, or a little behind it. Dorsal and anal fins without strong and undivided ray anteriorly. Scales very large, imbricated, much higher than long. Lateral line forming a downward curve beneath the middle of the flanks. Pharyngeal bones rather slender with an angular expansion at the upper portion of the descending branch, the expansion itself tapering away towards the upper and inner extremity. The teeth are compressed, of the prehensile kind, of the hooked type, very slightly hooked, provided with a grinding surface; being disposed upon a double row as follow: 2 | 4—4 | 2.

The teeth of this genus are figured by Heckel, under the name of *Argyreus rubripinnis*, the second species of his genus *Argyreus*, and which is nothing else but *Plargyrus cornutus* in a breeding dress.

The species are:

1. *PLARGYRUS CORNUTUS*.—*Cyprinus cornutus*, MITCH.—See Storer's Fishes of Mass. in Mem. Amer. Acad. v. New Ser. 1855, 118, where this species is figured and described.

2. *PLARGYRUS TYPICUS*.—*Rutilus plargyrus*, RAVIN. Ichth. Ohiens. 1820, 50.—*Leuciscus plargyrus*, KIEHL.—STOREY, Synops. 1846, 158.

3. *PLARGYRUS GIBBOSUS*.—*Leuciscus gibbosus*, STOREY, Proc. Bost. Soc. Nat. Hist. ii., 1845, 48; Synops. 1846, 166.

Alabama.

4. *PLARGYRUS FRONTALIS*.—*Leuciscus frontalis*, AGASS., Lake Sup. 1850, 368—Pl. iii. fig. 4.

Lake Superior.

5. *PLARGYRUS GRACILIS*.—*Leuciscus gracilis*, AGASS., Lake Sup. 1850, 370—Lake Huron.

6. *PLARGYRUS BOWMANI*.—We inscribe this species to the memory of one, who, under difficulties of various sorts, during a travel across the continent, thought it not of little importance to collect and preserve specimens of natural history, which he forwarded to the Smithsonian Institution. The species is gracefully subfusiform in its profile, the depth in advance of the dorsal being equal to the fifth of the entire length, in which the head itself enters about four times and a half. The eye is very large; its diameter being contained a little less than four times in the length of the side of the head. Dorsal region reddish brown; sides silvery, abdomen yellowish. A black streak along the flanks and above the lateral line.

A specimen, four inches in total length was caught in the Sweet water, a tributary of Platte or Nebraska river, by the late J. Soule Bowman.

Had the name of *Hypsolepis* not been made synonymous of *Plargyrus*, we might have applied it with perfect propriety to the group which we now call

CYPRINELLA,

since the fishes therein included, possess that curious character of scales higher than long. They replace in the South-west, the *Plargyri* of more northern climes. Though generally smaller than the species of *Plargyrus*, some do resemble the latter in a very striking manner, whilst others are much shorter and deeper in proportion. The chief differences between the present genus and *Plargyrus*, is to be found in the pharyngeal teeth and the position of the ventrals.

To *Moniana* it bears more striking resemblances and real affinities. The position of the ventral fins is the same, the pharyngeal bones are alike also, the teeth are of the same general pattern, but disposed upon a double series in *Cyprinella*, and upon one only in *Moniana*. Besides, in *Cyprinella*, the snout generally protrudes beyond the lower jaw, though the mouth is slightly oblique and subterminal. But let us formulate the generic characters of the genus we are now treating of: Body very compressed, either elongated and subfusiform, or else with the dorsal and abdominal outlines rather arched, but which may, after all,

simply indicate the female sex at the breeding season. The head is of moderate size, subconical, the snout generally protruding beyond the lower jaw. The mouth is small, slightly oblique and subterminal. No barbels of any sort. Eyes moderate. Isthmus narrow. Tail tapering, caudal fin bifurcated. Insertion of ventrals opposite or slightly in advance of the anterior margin of dorsal fin. Scales of moderate development, imbricated, much higher than long. Lateral line forming a downwards curve beneath the middle of the flanks. Pharyngeal bones like those of *Platygyrus*. The teeth are slender and compressed, of the raptorial kind of the hooked type, slightly hooked, without grinding surface, instead of which, a sharp ridge inconspicuously crenated, and disposed upon a double row of four and one, in the following manner, 1 | 4—4 | 1.

We knew already several species of this genus, besides one formerly described and with which we commence the list.

1. *CYPRINELLA BUBALINA*.—*Leuciscus bubalinus*, B. & G., in *Marcy's Expl. of Red Riv. of La.* 1853, 249. Zool. Pl. xiv. figs. 5—8.—It is one of those species, the dorsal outline of which is very much arched.

From Otter Creek, a tributary to the northern fork of Red River, Ark.

2. *CYPRINELLA UMBROSA*.—Also a deep bodied species, much larger than the preceding, indeed the largest of the species hitherto known of its genus. The ventral outline as much arched as that of the back. The greatest depth, taken at the anterior margin of the dorsal, is equal to the third of the length, the caudal fin excluded. The entire length measures about three inches and a quarter, the caudal fin being a little less than the greatest depth. The nape is a little depressed; the head constitutes the fourth of the length, caudal fin excluded. The eye is circular, its diameter entering a little over three times in the length of side of the head. The anterior margin of the dorsal is nearer the tip of the snout than the insertion of the caudal. The insertion of the ventrals is a little in advance the anterior margin of the dorsal.

D 8 + 2; A 9 + 2; C 3, 1, 9, 8, 1, 4; V 8; P 14.

Greyish red above; greyish white beneath. Fins unicolor.

Specimens were caught by H. B. Möllhausen, under Lt. Whipple, in Coal creek, a tributary to the southern fork of the Canadian river, Ark., and also twenty miles west of the Choctaw Agency.

3. *CYPRINELLA GUNNISONI*.—The body is short but not so deep as in the preceding species. The head is smaller than in *C. umbrosa*, but the eye preserves the same proportions. A characteristic feature may be found in the scales which show a greater portion of their surface, though equally as high. Color reddish brown, dark above and light beneath.

Collected in Cottonwood creek, a tributary of the Great Salt Lake of Utah, and brought home by Lt. E. G. Beckwith, U. S. A.

4. *CYPRINELLA BECKWITHI*.—A species allied to the preceding by its external form and general appearance, but readily distinguished from it by a larger head, and larger scales also. The latter one likewise larger than in *C. umbrosa*. Color greyish brown above, orange red beneath; fins unicolor.

From the sluices of the Arkansas river near Fort Makee; brought home by Lt. E. G. Beckwith, U. S. A.

5. *CYPRINELLA SCAVIS*.—This species establishes the transition between the deep and slender species. The head forms about the fifth, and the depth the fourth of the total length. Yellowish red above, and yellowish white beneath with a silvery hue.

Collected near San Antonio, Texas, by Dr. C. B. Kennerly, under Lt. A. W. Whipple, U. S. A.

6. *CYPRINELLA LEPIDA*.—Elongated and fusiform; the greatest depth taken upon the anterior third of the body, being contained four times and a half in the total length; the head forming a little less than the fourth of the same length. The

head, therefore, is well developed; the eye is circular, its diameter being contained four times in the length of the side of the head. The scales are larger than in any of its hitherto known congeners. Light reddish above, pale sulphur yellow beneath.

Caught in the Rio Frio, a tributary to the Rio Nueces, Texas, by Dr. C. B. Kennerly, under Lt. A. W. Whipple, U. S. A.

8. *CYPRINELLA NOTATA*.—Also an elongated and fusiform species, but easily distinguished from *C. lepida*, by a shorter head, less furcated caudal, and, especially, by smaller scales; the latter differing also in their general outline and radiating furrows. Reddish above; yellowish beneath, with a jet black patch upon the base of the caudal fin.

Collected in the Rio Seco, a tributary to the Rio Nueces, Texas, by Dr. C. B. Kennerly, under Lt. A. W. Whipple, U. S. A.

8. *CYPRINELLA WHIPPLII*.—Gracefully elongated and subfusiform. Dorsal region slightly arched upon the insertion of the fin. Greatest depth forming a little more than the fifth of the total length, whilst the head, which is subconical, constitutes a little less than the fifth of the same dimension. The eye is quite large, larger than in any other species of the same genus, since its diameter enters but a little over three times in the length of the side of head. Another very characteristic feature is to be found in a very high dorsal fin, rounded upon its upper margin. The origin of the ventral fins is situated opposite the anterior margin of the dorsal. The scales are of moderate development, and the lateral line is but slightly flexed downwards. Reddish brown above; golden yellow beneath; a black patch upon the posterior margin of the dorsal.

Caught in the Sugar Loaf creek, a tributary of PotEAU river, itself emptying its waters into the Arkansas river, near Fort Smith, Ark., by H. B. Möllhausen, under Lt. A. W. Whipple, U. S. A.

9. *CYPRINELLA MACROSTOMA*.—This species is very characteristic. The body is deep upon its middle, tapering posteriorly. The head is subconical, with a prominent snout and a very large mouth. The eye is well developed. The ventrals are inserted a little in advance of the anterior margin of the dorsal fin. Red; silvery upon the opercular apparatus and middle of the sides.

Specimens were collected in Devil's River, Texas, by John H. Clark, under Col. J. D. Graham, and at China, New Leon, by Lt. D. N. Couch, U. S. A.

10. *CYPRINELLA VENUSTA*.—Gracefully compressed and fusiform in profile. The snout protruding and subconical. The species is related to *C. macrostoma*, from which it chiefly differs by the relative size of its mouth and shape of the body. The ventrals are likewise inserted a little in advance of the anterior margin of the dorsal. Greyish red above, pale beneath; sides silvery. A black patch upon the base of the caudal fin.

Numerous specimens were collected in the Rio Sabinal, Texas, by Dr. C. B. Kennerly, under Major W. H. Emory.

11. *CYPRINELLA TEXANA*.—Body very slender and fusiform; head small and subconical; mouth small; eye large. Ventrals inserted under the anterior margin of the dorsal. Color reddish brown, sides silvery; lateral line accompanied by black dots terminating into a black spot upon the base of the caudal.

From Rio Salado, Texas, and Turkey creek, Texas, collected by John H. Clark, under Col. J. D. Graham.

12. *CYPRINELLA LUXILOIDES*.—At first, this species would remind us of certain species of *Luxilus* in its general appearance. The body being deep, gradually tapering away forwards and backwards. The head is well developed, and the mouth also. Ventrals inserted slightly in advance of the dorsal. Reddish brown above; silvery beneath.

From San Pedro creek, Texas, collected by Dr. C. B. Kennerly, under Major W. H. Emory.

13. *CYPRINELLA LUCUBRIS*.—Elongated, fusiform; head large and mouth accordingly, though the latter is smaller than in *C. macrostoma*. The ventrals are inserted under the anterior margin of the dorsal. Dark brown above, silvery upon the sides and under the belly.

The locality where this species was collected is not precisely known. It was brought home by Lt. E. G. Bockwith.

14. *CYPRINELLA LUDIBUNDA*.—All the specimens of this species which we have examined are immature, and yet there is no doubt in our mind as to its specific difference from all the species hereto alluded to. The head is small and conical, with the snout round and truncated. The mouth being small. The ventrals inserted in advance of the anterior margin of the dorsal. Color reddish brown; middle of sides silvery; lateral line marked with black dots.

Associated with the preceding, and collected under the same circumstances.

We next introduce a genus composed of small species, all being provided with scales similar in general outline, to those of both *Plargyrus* and *Cyprinella*: we call it

MONIANA.

Its species truly replace the *Plargyri* in a more southern latitude under a diminutive aspect. As regards structure, they differ widely from *Plargyrus*, as will appear by the following diagnosis: Body compressed, subfusiform. Head rather small, subconical or rounded. Snout occasionally protruding slightly. Mouth suboblique, terminal; both jaws generally equal. No barbels. Isthmus narrow. Eyes moderate. Caudal fin bifurcated. These characters, so far, are found in *Plargyrus*. But now for the differences. The insertion of the ventrals is situated in advance of the anterior margin of the dorsal, which is higher than long. The pharyngeal teeth are compressed, of the raptorial kind, of the hooked type, without grinding surface, instead of which, a sharp ridge is observed, very minutely crenated. They are disposed upon a single row of four, thus: 4—4.

Besides a species previously described, there are several new ones to be placed on record.

1. *MONIANA LUTRENSIS*.—*Leuciscus lutrensis*, B. & G. in *Marcy's Expl. of Red Riv. of La.* 1853, 251. Zool. Pl. xiv. figs. 9—12.

From Otter creek, tributary of the northern fork of Red River, Ark. It was also caught in Gypsum creek, a tributary of the false Washita River, by H. B. Möllhausen, under Lt. A. W. Whipple, U. S. A.

2. *MONIANA LEONINA*.—The largest of the hitherto known species of the genus. The entire length measures three inches and a quarter, the head forming the fourth of it, the caudal fin excluded. The body is very deep upon its middle, where the greatest depth is a little less than the fourth of the entire length. The mouth is proportionally small. The eye being circular, its diameter entering four times in the length of the side of the head. The rays are:

D 9 + 2; A 10 + 2; C 5, 1, 9, 8, 1, 7; V 9; P 16.

Greyish brown above; white or dull yellowish beneath.

Specimens were collected in Leon River, a tributary to the Rio San Antonio, Texas, by Dr. C. B. Kennerly, under Lt. A. W. Whipple, U. S. A.

3. *MONIANA DELICIOSA*.—This is one of the most slender of all the species hitherto known of the genus. Its length is a little over two inches and a half, the head forming the fifth part of it. The latter is proportionally small, subconical anteriorly. The eye is quite large and circular, its diameter entering about three times in the length of the side of the head. There are ten longitudinal rows of scales upon the greatest depth of the body; the scales them-

selves are large. The color is reddish brown above, silvery along the middle of the flanks and yellowish beneath.

Specimens of this species were collected in Leon River, a tributary of the Rio San Antonio, by Dr. C. B. Kennerly, under Lieut. A. W. Whipple, U. S. A.

4. *MONIANA PROSERPINA*.—is remarkable for its slender body, subconical head, and very small mouth. The eye is of moderate development. The total length is two inches and a quarter, the head constituting the fifth part of it. Eleven rows of scales may be counted upon the line of greatest depth of the body. Greyish brown above; metallic greyish white upon the sides and beneath.

From Devil's River, Texas; collected by John H. Clark, under Col. J. D. Graham, U. S. A.

5. *MONIANA AURATA*.—A most handsome species, with a rather deep body gradually tapering posteriorly, and a rounded and subtruncated head bearing minute spines upon its upper surface. The eye is proportionally small, and the mouth of medium size. Chestnut brown above; a diffused blackish streak along the middle of the flanks; golden beneath.

From Piedra Painte, New Mexico; collected by John H. Clark, under Col. J. D. Graham.

6. *MONIANA COMPLANATA*.—The most compressed of all the species so far known. The profile is regular; the peduncle of the tail rather slender. The total length is two inches and a half, the head entering in it five times and a half. The mouth and eye are of but moderate size. Scales large and very deciduous. Pale red above, silvery upon the sides and yellowish beneath.

Collected at Brownsville, Texas, by Capt. Van Vliet, U. S. A.

7. *MONIANA LÆTABILIS*.—The body is subelliptical in profile, the tail slender. The head well developed, being contained four times and a half in the total length, which measures about two inches. The greatest depth is equal to the length of the head. The fins are quite conspicuously developed; the scales large, as usual in the genus, being also deciduous. Reddish brown above, yellowish white beneath; sides silvery.

Specimens collected by H. B. Möllhausen, under Lieut. W. A. Whipple, in Hurah Creek, a tributary of the Rio Pecos, of the Rio Grande del Norte (Rio Bravo).

8. *MONIANA PULCHELLA*.—Allied to *M. lutrensis*, but differing from it by a shorter snout and a more compact tail. The eye is large also. A distinctive feature between the two species is to be found in the squamation, since the scales are more deeply imbricated in *M. lutrensis* than in *M. pulchella*. The color is reddish brown; silvery upon the sides.

Caught by H. B. Möllhausen, under Lieut. A. W. Whipple, U. S. A., in the Sugar Loaf Creek, emptying its waters into the Poteau River, itself a tributary of the Arkansas, near Fort Smith.

9. *MONIANA FRIGIDA*.—This species is a little more than three inches in total length, and stands next to the largest of the hitherto known species. The head forms about the fifth of the length. The body is rather deep and very much compressed; the caudal fin deeply forked. The eye is circular, and its diameter contained four times in the length of side of the head.

The rays of the fins are,

D 8+2; A 8+2; C 6, 1, 9, 8, 1, 6; V 8; P 13.

The color is of a reddish brown above, silvery white beneath. The middle of the flanks exhibits an indistinct or rather diffused silvery band, sometimes blackish.

Specimens of this species were collected by John H. Clark, under Col. J. D. Graham, U. S. A., in the Rio Salado, Rio Sabinal and Rio Medina, all three tributaries to the Rio San Antonio, and in the Rio Nueces also. It was likewise caught in the Rio Frio, a tributary of the Nueces by Dr. C. B. Kennerly, under Lieut. A. W. Whipple, U. S. A.

10. *MONIANA COUCHI*.—resembles *M. gracilis* most; is, however, distinguished from it by a less fusiform body and a much shorter head. This feature may be traced upon series of specimens of both species with an unfailing constancy. The eye is smaller also, and so is the mouth as might be deduced from the characters just alluded to.

From the vicinity of China, New Leon, Mexico; collected by Lieut. Couch, U. S. A.

11. *MONIANA RUTILA*.—has the general physiognomy of *M. gracilis*, from which it differs by a more advanced position of the dorsal fin and larger scales. Dorsal region greyish; sides and abdomen golden.

From Cadereita, New Leon, Mex.; collected by Lieut. D. N. Couch, U. S. A.

12. *MONIANA NITIDA*.—This species differs from *M. couchi* by a more elongated and fusiform body, more elongated head and much larger eye. From *M. rutila* it differs by the same characters of the body, but the head differs by the flattening of its upper surface. There are eleven longitudinal rows of scales upon the line of greatest depth of the body, five above and five below the lateral line. The latter, therefore, is nearly medial, forming but a slight curve upon the middle of the abdomen. Color pale red, sides of head and middle of the flanks silvery.

Collected at Cadereita, New Leon, by Lieut. D. N. Couch, U. S. A.

13. *MONIANA FORMOSA*.—The prettiest species of the genus; the body is ellipsoid in profile and the tail very much tapering. The region above the lateral line is blackish brown in the adult, and reddish brown in the young, occasionally also dotted with black; the inferior regions are reddish yellow anteriorly and yellowish red posteriorly.

Numerous specimens of this species were collected in the Rio Mimbres, Mex.

14. *MONIANA GRACILIS*.—A very graceful and slender species, resembling most *M. lutrensis*, from which it however differs by a much smaller head and a more arched back; the body itself is more compact. Ash grey above, yellowish white beneath; flanks silvery.

Specimens were collected near Monterey, New Leon, by Lieut. Couch, U. S. A.

15. *MONIANA GIBBOSA*.—May readily be distinguished from all its congeners by a short and arched body, resembling a cyprinodon as much as any fish we might compare it to. Pale reddish above, whitish beneath; sides silvery.

Specimens collected at Brownsville, Texas, by Capt. Van Vliet, U. S. A.

16. *MONIANA TRISTIS*.—A slender and graceful species, subfusiform in profile, though the back is rather arched. The peduncle of the tail is long and of nearly uniform depth. The head constitutes about the fifth of the length. Eleven rows of scales, five above, five below the lateral line. Reddish brown.

Brought home by Lieut. E. G. Beckwith, U. S. A.

The "Fauna Boreali Americana" records under the name of *Cyprinus (Abramis) balteatus*, a species of this family, which bears a strong external resemblance to the large species of *Luxilus*, and so much so, that, on a superficial examination, no one would hesitate to refer it to the latter genus. The structure of the pharyngeal teeth affords the most striking generic differences, as will be seen further on. In selecting for it the name of

RICHARDSONIUS,

we have borne in mind the eminent labors of the author of the work just referred to. We will characterize the genus by saying, that the body is very compressed, subelliptical or fusiform in its outline and deep upon its middle. The head is proportionally small; the mouth terminal, slightly oblique, constructed as in *Luxilus*, but somewhat larger, yet unprovided with cirri or barbels. The eye is large. Isthmus very narrow. Caudal fin forked; insertion of ventrals situated in advance of the anterior margin of the dorsal. Anal fin longer than the

dorsal, and its anterior margin situated anteriorly to the posterior margin of the base of the dorsal, in which respects it differs from *Luxilus*. The pharyngeal bones are narrow, with a slight expansion upon their convexity; the teeth being of the raptorial kind of the hooked type, strongly hooked, without grinding surface, instead of which a sharp but not crenated ridge. They are disposed upon a double row of four or five and two, as follows: 2 | 4—4 | 3, or 2 | 5—5 | 2.

The present genus bears some resemblance to *Squalius*, from which it may be distinguished by the smooth edge of the dental ridge and the long anal, with its peculiar position in reference to the dorsal. The scales are also smaller and much deeper than long, which is not the case in *Squalius*.

1. *RICHARDSONIUS BALTEATUS*. *Abramis balteatus*, RICHARDS. FAUN. BOR. AMER. III. 1836, 301.—STORER, Synops. 1846, 160.

The specimens before us were collected at Fort Vancouver and Fort Dalles, Columbia River, by Geo. Suckley, under Gov. I. I. Stevens.

2. *RICHARDSONIUS LATERALIS*,—is more of an elongated and fusiform aspect than *R. balteatus*. The head is contained four times and a half in the total length. The pharyngeal teeth are five upon the outer row, instead of four. Dorsal region blackish brown; lower part of sides and abdomen silvery; upper part of sides provided with a black band extending from head to tail.

Specimens procured at Fort Steilacoom, Puget Sound, W. T., by Dr. Geo. Suckley, U. S. A., under Gov. I. I. Stevens.

We adopt the genus

LUXILUS, Rafin.

To include such species as are congeneric with *Leuciscus chrysoleucus* of Mitchill, and *Luxilus chrysocephalus* of Rafinesque. It is one of the most characteristic genus of North American cyprinoid, and altogether misunderstood by Heckel; for, *Cyprinus chrysoleucus*, MITCH., which he places in his genus *Leucosomus*, is generally distinct from *Leuciscus pulchellus* of Storer, as I have had the opportunity to ascertain. The diagnosis given to *Leucosomus* by its author, and the figures representing the pharyngeal dentition, leave no room for doubt. *Leucosomus*, therefore, is not synonymous with *Luxilus*, but was really established upon a species most intimately related to the one yet unpublished, and which is the type of the genus *Cheilonemus*. The latter, therefore, must give way to *Leucosomus*, a circumstance unavoidable and very much to be regretted, for it complicates the synonymy of both *Luxilus* and *Leucosomus*.

We characterize as follows the genus *Luxilus*: "Body very much compressed, flattened laterally, and deepest upon the middle of its length. Head proportionally small and compressed like the body. Mouth small, terminal, unprovided with cirrhi or barbels. Eyes quite large. Isthmus small. Caudal fins forked; insertion of ventrals situated in advance of the anterior margin of the dorsal. Scales large; lateral line forming a very open curve, convex downwards." Pharyngeal bones much stouter superiorly than inferiorly; a slight expansion may be observed upon the convexity of these bones, extending upwards. The teeth are of the bruising kind of the hooked type with a slight hook and a well developed grinding surface, both edges of which being strongly crenated. They are disposed upon a single row of five, thus: 5—5. The three uppermost (sometimes the upper two only), stand out in bold relief from the line of the bone.

We meant to have observed, in speaking of the head, that the lower jaw fits into the upper one when the mouth is shut without protrusion of the snout, and that when the mouth is partly open, the lower jaw appears longer than the upper.

1. *LUXILUS AMERICANUS*.—*Cyprinus americanus*, LACEP.—*Cyprinus chrysoleucus*, MITCH.—*Leuciscus chrysoleucus*, STORER.—*Leucosomus americanus*, GRD.—For a de-

scription and a figure of this species, we refer to *Storer's* "History of the Fishes of Massachusetts," in the fifth volume of the memoirs of the American Academy.

2. *LUXILUS COMPRESSUS*.—*Rutilus compressus*, RAVIN. Ichth. Ohiens. 1820, 51.—KIATL. Rep. 169.—*Leuciscus compressus*, KIATL. Bost. Journ. of Nat. Hist. iv. 1843, 306. Pl. xv. fig. 2.—STORER, Synops. 1846, 157.

3. *LUXILUS OBEUSUS*.—*Leuciscus obeus*, STORER, Proc. Bost. Soc. Nat. Hist. i. 1845, 48; and Synops. 1846, 166.—*Silbe obeus*, AGASS. Amer. Journ. of Sc. 2d. Ser. xviii. 1854, 359.

4. *LUXILUS OCCIDENTALIS*.—*Leucosomus occidentalis*, B. & G. Proc. Acad. Nat. Sc. Philada. vii. 1854, 137.

5. *LUXILUS LEPTOSOMUS*.—Outline regularly subfusiform; the depth forming a little more than the fifth of the entire length. The head enters five times and a half in the same dimension. The anal fin is a great deal larger than the dorsal. The scales are larger than in any other species of the same genus.

D 9; A 13+2; C 5, 1, 9, 8, 1, 5; V 9; P 15.

Color greyish brown above; light reddish beneath; sides silvery. Forked margin of caudal, blackish grey.

From Dry Creek, near Victoria, Texas; collected by Dr. C. B. Kennerly, under Major W. H. Emory, U. S. A., Commissioner U. S. and Mex. Boundary.

6. *LUXILUS SECO*.—Body deeper than in *L. leptosomus*; depth equal to the fourth of total length. Head contained five times and a half in the same dimension. Eye very large; its diameter entering three times only in the length of the side of the head. Mouth small. Scales of moderate development. Light brown above, yellowish white beneath; sides silvery.

Specimens of this species were collected in the Rio Seco, a tributary of the Rio Nueces, Texas, by Dr. C. B. Kennerly, under Lieut. A. W. Whipple, U. S. A.

7. *LUXILUS LUCIDUS*.—General form resembling that of *L. seco*. The head, however, is contained but four times in the length of the side of the head. The mouth is a good deal larger, whilst the eye is smaller. The scales, likewise, attain to a greater development. The color is the same as in the preceding species, with the exception that the tint of the back has a greyish hue and extends more to the sides.

Collected by H. B. Müllhausen, under Lieut. A. W. Whipple, U. S. A., in Coal Creek, a tributary of the South Fork of the Canadian River, and also twenty miles west of Choctaw Agency.

In the *Ichthyologia ohiensis* we find the genus

SEMOTILUS, Rafn.

which, though imperfectly characterised, leaves not doubt as to the species the author intended to include in it. *Semotilus dorsalis* and *Semotilus cephalus*, are both well known species. *S. dipetris*, on the other hand, does not come under this head. The genus *Semotilus* we therefore restore with the following characters: Head subconical, both jaws equal or else even anteriorly; cleft of mouth slightly oblique upwards. The mouth itself being large, surmounted with soft lips and without barbels. The isthmus is rather narrow. The insertion of the ventral fins is situated in advance of the anterior margin of the dorsal fin which is higher than long. The caudal is bifurcated. The scales, of moderate size. The pharyngeal bones are narrow, very slightly expanded upon the upper half of their curve. The teeth are of the voratorial kind, of the hooked type without grinding surface, stoutish, moderately hooked and disposed upon a double row in the following manner: 2 | 5—5 | 2; sometimes 2 | 4—5 | 2. Generally speaking, a black or brown spot may be observed at the base of the anterior margin of the dorsal fin.

Besides the two species just referred to, the present genus will include :

3. *SEMOTILUS ATROMACULATUS*.—*Cyprinus atromaculatus*, MITCH.—*Leuciscus atromaculatus* of more modern writers. *Leuciscus iris*, VAL. in *Cuv. & Val.*, Hist. Nat. Poiss. xii. 1844, 255, pl. 496.

4. *SEMOTILUS MACROCEPHALUS*.—Easily distinguished by its very large head which forms more than the fourth of the entire length. Its body is very much compressed and tapering posteriorly. The scales are more uniformly imbricated than in *S. atromaculatus*, in which there is a noted difference it that respect between the anterior and posterior portions of the body. The species of this genus are generally very uniform ; the number of the rays of the fins hardly undergoes any variation. In the present species they stand as follows :

D 9+2 ; A 9+2 ; C 6, 1, 9, 8, 1, 5 ; V 8 ; P 15.

Two rudimentary rays in front of both the dorsal and anal, one of which very exiguous. Brownish grey above ; silvery white beneath. A black spot at the base of caudal also.

Specimens were collected at Fort Pierre, Nebr., by Dr. John Evans, U. S. Geologist.

5. *SEMOTILUS SPECIOSUS*.—A graceful and slender fish, subfusiform in its outline, the head, which is conical and pointed forwards, constituting exactly the the fourth of the entire length. The ventrals are situated a little further than in *S. atromaculatus*. The scales of the dorsal region in advance of the dorsal fin are quite small ; and those on the thoracic region smaller than posteriorly along the sides of the tail.

There are thirteen rays in the pectorals ; the number of rays in the other fins does not differ from the preceding species.

The dorsal region is reddish brown ; the abdomen is yellowish or whitish. A black vitta extends from the nose across the face and eye to the base of the caudal, where exists also a circular black spot, similar to the one upon the base of the anterior margin of the dorsal.

Collected in the Sweet Water, a tributary of Platte or Nebraska River, by the late J. Soule Bowman.

We come next to a small fish, constituting a new genus, not without analogy with the Gudgeons, differing from the true Gudgeons, by the absence of barbels either maxillary or buccal and a less prominent snout. We propose to call it

TIAROGA,

and characterise it as follows : Head small, subconical, depressed. Mouth obliquely terminal, of moderate size and without barbels of any kind. Upper jaw slightly longer than the lower. Eye of medium size. Isthmus very wide. Body slender, subfusiform, compressed. Fins are well developed ; dorsal and anal narrow and high ; caudal bifurcated. The insertion of the ventrals takes place in advance the anterior margin of the dorsal. The scales are small ; the lateral line, medial. The pharyngeals are similar to those in *Gobio*. The teeth are likewise of the same character : slender, subcylindrical upon their base compressed above, of the raptatorial kind of the hooked type, without grinding surface and disposed upon a double row of one and three, thus : 1 | 3—3 | 1.

So far but one single species is known.

TIAROGA COBITIS.—About two inches and a half in total length, the head forming about the fifth of it. The eyes approximate the upper surface of the head which is rounded. The upper regions are brownish, with small blackish spots ; the inferior regions are unicolor of a yellowish tint. A black spot upon the base of the caudal fin.

Specimens collected by John H. Clark, under Col. J. D. Graham, in the Rio San Pedro, a tributary of the Rio Gila.

About three years since, the genus

GILA, B. & G.

was proposed, to include species whose body was subfusiform, compressed, with the back more or less arched, especially in large and old specimens, and sometimes tapering very much posteriorly, with the peduncle of the tail very slender. The head being depressed and proportionally small, with its upper outline often concave; the snout is elongated; the eyes are of moderate size; the isthmus small. The mouth is of medium size, the upper jaw overlapping the lower, so as to conceal its cleft from above. No barbels, or rudiments of barbels. The pharyngeal bones are well developed, the inferior limb, elongated, the upper one forming an open curve; the convexity being somewhat expanded, the expansion tapering along the upper and inward limb. The teeth are well developed, of the raptorial kind of the hooked type, without grinding surface, subcylindrical slightly compressed and disposed upon a double row of one or two and four or five as follows: 1 | 4—5 | 2, or even, 2 | 4—5 | 2. The ventral fins are inserted in advance of the anterior margin of the dorsal. The caudal is bifurcated. The scales are small on the dorsal region and of medium size on the sides, and longer than high. The lateral line forms an open curve along the middle of the abdomen.

The species which we now include in this genus, are the following:

1. GILA ROBUSTA, B. & G. Proc. Acad. Nat. Sc. Phila. vi. 1853, 368; and in *Sigr. Rep. Zuni and Color. Riv.*, 1853, 148. Fishes, Pl. I.
From Zuni River.—Dr. Woodhouse.

2. GILA ELEGANS, B. & G. Proc. Acad. Nat. Sc. Phila. vi. 1853, 369; and in *Sigr. Rep. Zuni and Color. Riv.*, 1853, 149. Fishes, Pl. II.

Specimens from Zuni River, collected by Dr. Woodhouse; from the Colorado, collected by A. Schott, under Major Emory, and from the Gila, collected by Dr. Heermann, under Lieut. J. G. Parke, U. S. A.

3. GILA GRACILIS, B. & G. Proc. Acad. Nat. Sc. Phila. vi. 1853, 369; and in *Sigr. Rep. Zuni and Color. Riv.*, 1853, 151. Fishes, Pl. III.
From Zuni River.—Dr. Woodhouse.

4. GILA GRAMMII, B. & G. Proc. Acad. Nat. Sc. Phila. vi. 1853, 389.
From Rio San Pedro, a tributary of the Rio Gila.—John H. Clark.

5. GILA EMORI, B. & G. Proc. Acad. Nat. Sc. Phila. vi. 1853, 388.
From Gila River, collected by Dr. John L. Leconte.

We separate from the genus *Gila*, under the name of

TIGOMA,

some species formerly excluded by us in other genera, to which we add a few others not hitherto described. They all bear a general resemblance to *Gila*, from which they differ by a much smaller mouth, and larger scales, and those of the dorsal region, though smaller than on the sides, are not so disproportionate. The ventrals are inserted in advance of the anterior margin of the dorsal, and the caudal is bifurcated. It is not deemed superfluous to state that there are no barbels at the angle of the mouth, and a characteristic of this genus as distinct from *Gila*, consists in its terminal mouth and even jaws. The pharyngeal bones resemble very much those of *Gila*, but the inferior limb is not quite so long, the convexity not quite so expanded, and the upper limb more curved inwards. As to the teeth, it requires a minute observation to detect a difference; they are more compressed and more strongly hooked, otherwise of the raptorial kind, of the hooked type either without a grinding surface, or else a grinding surface more or less developed. They are disposed in the following wise: 2 | 5—5 | 2, 2 | 4—5 | 2, or 1 | 4—5 | 2, and some intermediate formulæ.

A. Teeth without grinding surface.

1. *TIGOMA PULCHELLA*.—*Gila pulchella*, B. & G. Proc. Acad. Nat. Sc. Philad. vii. 1854, 29.

From Rio Mimbres, a tributary of Guzman Lake, Mex.—John H. Clark.

2. *TIGOMA CONFORMIS*.—*Lavinia conformis*, B & G. Proc. Acad. Nat. Sc. Philad. vii. 1854, 137.

From Posa Creek, San Joaquin Valley, Cal.—Dr. A. L. Heermann.

3. *TIGOMA BICOLOR*.—A large species, the largest of the genus hitherto known to us. It is twelve inches in total length; the head forming the fourth of it. The greatest depth is nearly equal to the length of the head. The eye is subcircular, and its diameter contained about six times in the length of the side of the head. The origin of the ventrals is situated but slightly in advance of the dorsal. The latter is higher than long throughout the genus. The scales are quite large. The dorsal region is bluish grey; the sides and belly are silvery white, sometimes golden, but always in contrast with the tint of the back.

Specimens of this species were collected in Tlamath Lake, O. T., by Dr. John S. Newberry, under Lt. Williamson, U. S. A.

4. *TIGOMA PURPUREA*.—This is a much stouter fish than *T. pulchella*, which it resembles in other respects; but its head is larger and its body shorter. The anterior margin of the dorsal is nearer the extremity of the caudal than the tip of the snout, whilst in *T. pulchella* it is nearer to the snout than the extremity of the caudal. The scales are also larger than in *T. pulchella*. The color is of purplish black above and on the sides; beneath yellowish.

Collected at San Bernardino, in the upper waters of Rio Huagui, west of the Sierra Madre, by Dr. C. B. Kennerly, under Major W. H. Emory.

5. *TIGOMA INTERMEDIA*.—Intermediate between *T. pulchella* and *T. purpurea*, more closely related however to the former than to the latter. The fins are much less developed, the inferior fins especially are quite small.

Collected in the Rio San Pedro, of the Gila, by John H. Clark, under Col. J. D. Graham, U. S. A.

6. *TIGOMA OBESEA*.—A very characteristic species by its short and deep body, its short and conical head, and its small fins. It bears a general resemblance to *T. purpurea*, but its head is much smaller. Color of dorsal region bluish grey; upper half of sides dotted, lower half unicolor and yellowish white like the belly.

Specimens of this species were collected in Salt Lake Valley by J. Soulé Bowman.

7. *TIGOMA HUMOLDTI*.—Resembles *T. obesa* by a deep and rather short body, but the latter is covered with much larger scales. The head and eyes are also much larger. The dorsal region above the lateral line is bluish or greyish black and so the upper surface of the head. The rest is red and golden, except a narrow blackish streak below the lateral line, extending from the thoracic belt to near the anal fin.

Collected in Humboldt river by J. Soulé Bowman, and Lt. E. G. Beckwith, U. S. A.

8. *TIGOMA LINEATA*.—The general aspect is elongated, the body being subfusiform, and the head small and conical, constituting a little less than the fourth of the total length. The ground color is yellowish; the centre of the scales of the upper regions being black, the back and upper half of the flanks appear as if marked with alternate lines of black and yellow.

Specimens of this species were likewise collected by Lt. E. G. Beckwith.

9. *TIGOMA GRACILIS*.—The body is elongated and compressed, subfusiform, resembling *T. lineata*, but the head is more elongated. The ventrals are inserted but a little in advance of the anterior margin of the dorsal, whilst they are more so in *T. lineata*. In the latter the pectorals are short and broad; in the present species they are narrow and elongated. The scales are smaller than in *T. lineata*. Bluish grey above and on the sides; yellowish beneath.

Collected by Lt. E. G. Beckwith, U. S. A.

B. Teeth provided with a grinding surface more or less conspicuous.

10. *TIGOMA GIBBOSA*.—*Gila gibbosa*, B. & G. Proc. Acad. Nat. Sc. Philad. vii, 1854, 28.—Resembles *T. purpurea*, but its scales are a good deal smaller.

Specimens were collected near Santa Cruz, by John H. Clark, under Col. J. D. Graham, U. S. A. and at Tucson, Sonora, by Dr. A. L. Heermann, under Lt. J. G. Parke, U. S. A.

11. *TIGOMA NIGRESCENS*.—This is quite an elegant species, being elongated and slender like *T. pulchella* and *T. gracilis*. It differs from *T. gibbosa* by a more conical head and snout. The ground color is yellowish, the body of the scales being covered with crowded black dots, the back and sides appear almost black, The belly is unicolor. In the young, the upper regions are lighter than in the adult.

Specimens were collected in the Boca grande and Janos river, by Dr. C. B. Kennerly under Major W. H. Emory, U. S. A.

12. *TIGOMA PULCHRA*.—The body is gracefully elongated, in which respect it resembles *T. nigrescens*, from which it may be distinguished by its smaller head and larger scales. The color, moreover, is of a far more brilliant type: the dorsal region is reddish or blackish brown, the sides and belly of a uniform golden yellow; a diffused black streak may occasionally be seen along the upper portion of the flanks, very likely more predominant in the male than in the female.

Collected in Chihuahua River and tributaries, by John Potts, Esq., of Chihuahua, Mex.

13. *TIGOMA CRASSA*.—This species has a short and deep body; the greatest depth being more than the fourth of the entire length. The head is small and conical, constituting nearly the fifth of the entire length of the fish. The scales are very large, higher than long and the lateral line deflexed upon the abdomen as usually the case in this genus. The color of the back is bluish or purplish black, greyish black on the sides where the yellowish ground color appears; beneath unicolor.

Caught in the Sacramento River near Fort Reading, Cal., by Dr. John S. Newberry, under Lt. R. S. Williamson, U. S. A.

Next to these numerous species in which the system of dentition seems to be in an unstable condition, we place the new genus

CHEONDA,

which has the general aspect of both *Gila* and *Tigoma*, by the position of the ventrals in advance of the anterior margin of the dorsal, by the absence of barbels at the angle of the mouth, which is of moderate size.

The body is elongated, fusiform in profile, and very much compressed. The caudal fin is bifurcated. The head is rather small and subconical, and the snout, though rounded, is yet elongated. The eye is large and the isthmus small or narrow. The scales being of medium size and the lateral line greatly deflexed upon the abdomen. The teeth are of the prehensile kind, of the hooked type, with a grinding surface; they are compressed and disposed upon a double row of two and four and five, thus: 2 | 4—5 | 2.

1. *CHEONDA COOPERI*.—The fins are well developed and the anal is larger than the dorsal. Their formula is as follows:

D 10+12; A 11+2; O 7, 1, 9, 8, 1, 6; V 9+1; P 16.

The dorsal region is reddish grey; the sides and belly silvery white, with a golden reflect.

Collected at Fort Vancouver, Columbia River, by Dr. John G. Cooper.

2. *CHEONDA CERULEA*.—May readily be distinguished from its congener by

the presence of much smaller fin; the anal is a good deal smaller than the dorsal, and the ventrals a little less anterior, with reference to the dorsal.

D 10+2; A 8+2; 6, 1, 9, 8, 1, 6; V 10+1; P 16.

Upper regions of a greyish azur; inferior regions dull silvery white; black dots scattered all over the back, sides and belly.

Caught in Lost River, O. T., by Dr. John S. Newberry, under Lt. R. S. Williamson, U. S. A.

There is another generic type, for which we have provided the name of

SIBOMA,

composed so far of but two species, one of which originally referred to the genus *Lavinia*. It is to be recognized by a stout and somewhat compressed body, covered with large scales. The caudal is crescent-shaped posteriorly; the origin of the ventrals is situated a little posteriorly to the anterior margin of the dorsal, or immediately under it. The head is rather small, sloping towards a wedge-shaped snout, rounded superiorly. The mouth is of small size, horizontal, terminal, with jaws even. No barbels. Eye below the medium size. Isthmus rather narrow. Pharyngeal bones stout, expanded upon their convexity, with the inferior branch short and bent inwardly so that its extremity is directed outwardly, whilst the upper branch is slightly bent inwards. The teeth are large and very compressed, and terminated by a slender hook. They are of the raptorial kind, of the hooked type without grinding surface properly so called, but instead of a sharp edge along the inner margin of the teeth, a blunt and narrow ridge may be observed. They are disposed upon a double row of one and two and four and five, as follows: 1 | 4—5 | 2.

1. *SIBOMA CRASSICAUDA*.—*Lavinia crassicauda*, B. & G. Proc. Acad. Nat. Sc. Philad. viii. 1854, 137.

Specimens of this species were procured by Dr. A. L. Heermann, under Lt. R. Williamson, in the San Joaquin, Mercede and Mohave Rivers, Cal.

2. *SIBOMA ATRARIA*.—The largest specimen of this species which we have examined is about seven inches in length, and although small, compared to the specimens of *S. crassicauda*, to which we had to compare it, yet the distinctive features between the two species appear very striking. And first of all, the imbrication of the scales in *S. atraria*, is such as to expose more of their surface than in *S. crassicauda*, and moreover the lateral line in *S. atraria* runs along the seventh row of scales from the insertion of the ventrals upwards, leaving eleven rows above it, to the base of the dorsal fin, whilst in *S. crassicauda*, there are as many rows of scales below as above the lateral line. The absolute number of longitudinal rows of scales is the same in both species. The head is proportionally larger than in *S. crassicauda*, but the fins are much less developed. The ground color is olivaceous, the sides and the back being nearly black or brownish black, from the number of confluent maculae and dots. The fins itself are blackish upon an olivaceous ground. The sides and upper part of the head, are likewise brownish black.

Found in a spring, in Utah District, near the Desert, by Lt. E. G. Beckwith.

The species which are arranged under the genus

PTYCHOCEILUS, Agass.

remind us by their general appearance of both *Mylocheilus* and *Mylopharodon*. They have an elongated, subcylindrical and compressed body, an elongated head, a mouth deeply cleft, but no barbels upon its angle. The upper jaw overlaps the lower, though the mouth remains horizontal and subterminal. The eye is of moderate size; and so with the isthmus. The ventral fins are inserted a little in advance of the anterior margin of the dorsal. The caudal is furcated. The scales, of medium size; the lateral line nearly medial. The

pharyngeal bones are long and slender, slightly expanded upon their convexity, with the inferior limb much more slender than the upper. The teeth are of the raptatorial kind, of the hooked type without grinding surface, subconical, slightly hooked, and disposed upon a double series of two and four or five, thus: 2 | 4—4 | 2, or 2 | 5—5 | 2.

1. *PTYCHOCHILUS GRANDIS*.—*Gila grandis*, AYRES, Proc. Cal. Acad. Nat. Sc. i. 1854, 18.—*Ptychocheilus major*, AGASS. Amer. Journ. of Sc. 2d. Ser. xix. 1855, 229.

San Francisco, Cal.—Dr. Newberry.

2. *PTYCHOCHILUS OREGONENSIS*.—*Cyprinus (Leuciscus) oregonensis*, RICH. FAUN. BOR. AMER. iii. 1836, 305.—*Ptychocheilus gracilis*, AGASS. & PICK. Amer. Journ. of Sc. 2d. ser. xix. 1855, 229.

Specimens of this species were collected at Fort Vancouver and Fort Stella-coom, by Dr. Geo. Suckley, at Astoria, O. T. by Lt. Trowbridge, and in Villamette River, by Dr. Newberry, under Lt. Williamson, U. S. A.

3. *PTYCHOCHILUS RAPAX*.—This is a large species too, differing from *P. grandis* by a proportionally shorter head, a more advanced position of the ventral fins and by much smaller scales on the dorsal region in advance of the dorsal. The inferior limb of the pharyngeal bones is not so long and slender, and there are but four teeth upon the main row, instead of five. The teeth and bones are stouter. Colors, blackish brown above; whitish beneath.

From Monterey, Cal.; collected by Lt. W. P. Trowbridge, U. S. A.

4. *PTYCHOCHILUS LUCIUS*.—A very characteristic species. The body is compressed, but the head is flattened or depressed and very much developed, constituting nearly the fourth of the entire length. The dorsal and ventrals are situated quite posteriorly. The scales are below the medium size, and the lateral line is bent downwards upon the abdomen. The pharyngeal bones are very slender; the inferior limb is almost exiguous and proportionally as long as in *P. grandis*. There are, however, but four teeth upon the main row, instead of five, as in the case of *P. grandis*. Color bluish grey above; silvery golden beneath.

Collected in the Rio Colorado, by A. Schott, under Major W. H. Emory, Commissioner U. S. and Mex. Boundary.

5. *PTYCHOCHILUS VORAX*.—The head is also depressed in this species, but it is much smaller since it constitutes the two-ninths of the entire length. The body is much deeper than in *P. lucius*, and the ventrals are situated more in advance of the dorsal. The dorsal itself is not situated so far back. The scales are very small upon the dorsal region between the dorsal fin and the occiput. Bluish above; silvery beneath.

Specimens were brought home by Lt. E. G. Beckwith, U. S. A. The precise locality, not known.

APPENDIX.

The following species are here recorded as complementary to the preceding ones.

1. *HYPOGNATHUS REGIUS*.—A large and beautiful species, the largest that has, so far, come to our knowledge, some of the specimens measuring seven inches in length. The body is gracefully elongated, compressed, fusiform in its outline. The greatest depth, taken immediately in advance of the dorsal fin, is contained about five times in the length, or five, and a third of a time. The head is of moderate development, subconical, subtruncated, contained six times in the total length. The mouth is quite small. The isthmus, very narrow. The origin of the ventrals recedes a little from the anterior margin of the dorsal,

which anterior margin of the dorsal, is nearer to the tip of the snout than the base of the central rays of the caudal.

D 2+9; A 2+9; C 5, 1, 9, 8, 1, 7; V 8; P 15.

There are thirty-eight scales in the lateral line; six longitudinal rows above it, and four beneath, upon the line of greatest depth. Color brownish red above, pale reddish beneath; flanks shining of silver and gold.

Inhabits the Potomac River, and probably all the fresh waters of Maryland. It is commonly called *Smelt*, at Washington and vicinities, and *Gudgeon* at Baltimore and surrounding counties.

2. *HYBOGNATHUS NITIDUS*.—*Leuciscus nitidus*, DEKAY, N. Y. Fauna. iii. 1842, 209. Pl. xxxiii. fig. 105.—STORER, Synops. 1846, 162.

Collected at Westport, Lake Champlain.—S. F. Baird.

HUDSONIUS.

Body elongated, compressed, fusiform in profile, and covered with quite large scales. The lateral line being nearly medial. The head is of but moderate size; the snout being subconical and rounded anteriorly. The mouth is subterminal, somewhat protractile, in which situation it is directed obliquely forwards and downwards; when shut, the lower jaw fits within the upper, the snout being slightly protruding. There are no barbels about the mouth. The eyes are large; the isthmus is small. The dorsal is higher than long; its anterior margin is even with the insertion of the ventrals. The anal has a proportionally longer base than the dorsal. The caudal is deeply furcated. The pharyngeal bones are well developed; the inferior limb is rather short, its extremity being flattened and slightly turned outwardly. From the middle of the convexity a sudden expansion occurs, tapering into the upper limb, slightly curved downwards. The teeth are of the bruising kind, of the hooked type, provided with a grinding surface. But there occurs many irregularities, being more or less hooked and the grinding surface more or less developed. It is not uncommon to observe all these variations upon the pharyngeal of a single specimen. The teeth are disposed upon a double row with the following variations: 2 | 4—4 | 2, 2 | 4—4 | 1, 0 | 4—4 | 2, or 0 | 4—4 | 1.

1. *HUDSONIUS FLUVIATILIS*.—*Clupea hudsonia*, CLINTON, Ann. Lyc. Nat. Hist. N. Y. I. 1824, 49. Pl. ii. fig. 2.—*Leuciscus hudsonius*, DEKAY, Fauna. of N. Y. III. 1824, 206. Pl. xxxiv. fig. 109.—STORER, Synops. 1846, 157.—AGASS. Lake Sup. 1850, 272.

Specimens collected in Chicago Harbor, Lake Michigan, and in the Root River, at Racine, Wisc.—S. F. Baird.

2. *HUDSONIUS AMARUS*.—This species is closely allied to the preceding, from which it differs by a smaller head and smaller eye. Its opercle is also broader compared to its height or depth. The head constitutes the sixth of the total length. The greatest depth taken immediately in advance of the dorsal, enters a little over five times in the total length.

The coloration is nearly the same as in *H. fluviatilis*, with the exception that the black spot at the base of the tail disappears at a much earlier period. The species grows to a much larger size also; we have seen specimens seven inches long, in which the satin band along the sides and the black spot of the tail had given way to a uniform golden hue extending to nearly the entire body.

Caught in Chesapeake Bay, and as far up the Potomac River as Washington, where it is caught along side with *Hybognathus regius*, and similarly called *Smelt*.

HYBOSIS, Agass.

This genus was left rather vaguely defined by its author, for there are many genera in which "the mouth is protractile downwards, after the fashion of *Catostomus*" with the lips neither swollen nor thickened. And many other genera

too, in which there is "only four or five compressed and hooked teeth in each main row, and one or two in a second row." What is really of generic value is left for us to conjecture, since we are not in possession of its typical species.

The generic characters which we now offer are based upon *Leuciscus storerianus* and a new species from Alabama, and should they prove generally distinct from *H. gracilis*, a new name will have to be coined for our species.

Body elongated, compressed, subfusiform in profile, covered with rather large scales. The lateral line being straight, along the middle of the flanks. The head is of moderate size, subconical and rounded upon the snout which protrudes beyond the lower jaw. A barbel, inserted upon the anterior margin of the posterior extremity of the maxillary, may be seen at the angle of the mouth. The eyes are large, the isthmus narrow. The dorsal is a little higher, and the anal deeper, than long. The insertion of the ventrals takes place opposite the second ray of the dorsal, hence very nearly under its anterior margin. The tail is deeply furcated. The pharyngeal bones have the same form and appearance as in *Hudsonius*; the teeth are likewise of the same kind (bruising) and type (hooked with a grinding surface), but more irregular yet. Sometimes not hooked, the grinding surface contorted and nearly absent, or even resembling a truncated cone. They are disposed upon a double row of four and one: 1 | 4—4 | 1, or 0 | 4—4 | 1.

This genus, it will appear, is intimately related to *Hudsonius*, from which it chiefly differs by the presence of barbels at the angle of the mouth, and by its straight lateral line also.

1. *HYBORIS STORERIANUS*.—*Rutilus Storerianus*, KIRTL. Proc. Bost. Soc. Nat. Hist. 1. 1842, 71.—*Leuciscus storerianus*, KIRTL. Bost. Journ. Nat. Hist. V. 1845, 30. Pl. ix. fig. 2.—*Storer*, Synops. 1846, 265.

From Marietta, Ohio.—Prof. E. B. Andrews; Russellville, Ky.—Dr. Shumard.

2. *HYBORIS WINCHELLI*.—It is a shorter and more contracted species than the preceding. The head forming but the fifth of the total length, whilst it constitutes the sixth in *H. storerianus*. The eye and mouth are also larger: the same is the case with the scales. The color is pale red with a silvery streak along the middle of the flanks.

From Black Warrior River, Ala.—Prof. A. Winchell.

CLINOSTOMUS.

A genus instituted to include several new species, together with one previously described as a *Leuciscus*. Its characters are as follows: Body elongated, compressed, subfusiform in profile. The head is compressed like the body, the frontal surface being very declivous and sloping towards a pointed rostrum, so that in profile the head is subtriangular, and if broader, would be wedge-shaped when seen from above. The mouth is very large, the lower jaw longer than the upper, beyond which it protrudes, giving to the cleft an oblique direction upwards. The eye is very large; the isthmus, quite narrow. The dorsal is higher than long, and inserted on the space between the ventrals and the anal, a little nearer to the former than the latter in a vertical line. The caudal is deeply furcated. The scales are of but moderate development, varying considerably in size between the different species. The lateral line forms a downwards curve upon the abdomen so as to bring its convexity nearer to the ventral than the dorsal outline. The pharyngeal bones are rather slender, the lower limb especially; a slight expansion may be observed upon their convexity; the upper limb being flattened, bent inwardly and either shorter or of equal length with the lower limb. The teeth are of the raptorial kind, of the hooked type without grinding surface, and disposed thus: 2 | 4—4 | 2, or 2 | 5—4 | 2, and sometimes 1 | 4—4 | 2.

This genus is more closely related to *Psychocheilus* than to any other of the family. The pharyngeal teeth are constructed upon the same pattern; the chief difference being found in the inclined cleft of the mouth, and the protrusion of the lower jaw beyond the upper.

1. *CLINOSTOMUS ELONGATUS*.—*Luxilus elongatus*, KIRTL. Rep. 1838, pp. 169, 193.—Bost. Journ. Nat Hist. III. 1840, 339. Pl. iv. 1.—*Leuciscus elongatus*, DEKAY, Fauna. of N. Y. III. 1843, 214.—STORER, Synops. 1846, 161.—VAL. in Cuv. & Val. Hist. Nat. Poiss. XVII. 1844, 494.—*Leuciscus productus*, STORER, Synops. 1846, 164.

Inhabits most of the tributaries of the Ohio River.

2. *CLINOSTOMUS FUNDULOIDES*.—The body is proportionally much shorter than in *C. elongatus*, and less tapering posteriorly also. The head constitutes a little more than the fifth of the entire length. The greatest depth is equal to the length of the head. The eye is a little smaller than in any of its hitherto known congener; its diameter entering three times in the length of the side of the head. The scales are a good deal larger than in *C. elongatus*. The color is of a pale red, with a silvery hue along the middle of the flanks, and a few scattered black spots.

The specimens before us we caught in the creeks and inlets of the Potomac River, in the neighborhood of Washington, D. C., the largest of which measuring about three inches.

3. *CLINOSTOMUS AFFINIS*.—Resembles the preceding one in its general bearing. The body however seems to be more tapering posteriorly, the head larger and the mouth more deeply cleft, since the posterior extremity of the maxillary reaches a vertical line passing through the anterior rim of the pupil, whilst in *C. funduloides* the extremity of the same bone extends but half way between the anterior rim of the orbit and the pupil. The eye is a little larger also, whilst the scales are smaller.

Inhabits the waters of James River, Va.—Collected by S. F. Baird.

4. *CLINOSTOMUS CAROLINUS*.—The head is larger than in *C. affinis*, and the body more elongated, compared to the depth. The eye is a great deal larger, and the scales smaller. Blackish brown above, with scattered black spots; reddish beneath; flanks golden.

From Salem, N. C.—Collected by J. T. Lineback and School. Specimens sent to the Smithsonian Institution.

ALBURNUS LEPIDULUS.—The most slender and elongated of the species hitherto known to us. The total length is about four inches, in which length, the depth enters a little over eight times. The head itself constitutes about the sixth of the length. The posterior extremity of the maxillary scarcely reaches the vertical line drawn in advance of the orbit. The caudal fin is a little longer than the head. The anterior margin of the dorsal fin is nearly equidistant between the tip of the snout and the concavity of the caudal. The pectorals and ventrals are rather small. A broad silvery band may be observed above the lateral line.

Specimens from Black Warrior River, Ala.—Prof. A. Winchell.

PLARGYRUS ARGENTATUS.—A specimen of this species is about three inches long, the head forming the fifth of the entire length. A vertical line drawn across the anterior rim of the orbit, intersects the extremity of the maxillary bone. The eye is large; its diameter entering three times in the side of the head. The dorsal scales anterior to the dorsal fin are quite small, contrasting greatly with those of the side which are well developed. The anterior margin of the dorsal is nearer to the insertion of the rays of the caudal fin than the tip of the snout. The dorsal region is pale red, whilst the sides appear as if coated with silver.

Inhabits the waters of James River, Va.—S. F. Baird.

CERATICHTHYS, Baird.

Body elongated, fusiform or subfusiform, somewhat compressed. Head flattened above, very declivous anteriorly with the snout rounded and overlapping the lower jaw. Mouth moderate in size, subterminal and horizontal

provided with a barbel upon its angle, and inserted upon the extremity of the maxillary bone. Eye approximating the upper surface of the head, and rather moderate in size. The isthmus is wide. The insertion of the ventrals is even with a vertical line drawn from the anterior margin of the dorsal fin. The latter is higher, and the anal deeper—than long. The scales are large, and the lateral line nearly straight along the middle of the flanks. The pharyngeal bones are pretty stout upon their convexity which is very slightly expanded, whilst the upper and lower branches are nearly equally developed, the latter however, more slender. The teeth are stoutish, compressed, of the prehensile kind of the hooked type, generally without grinding surface. Sometimes, however, a grinding surface may be observed upon some of the teeth which are subject to some variations being compressed or else subconical, generally hooked and occasionally conical. They are disposed upon a single row: 4—4.

1. *CERATICTHYS BIGUTTATUS*, Bd.—*Semotilus biguttatus*, KIRTL. Bost. Journ. Nat. Hist. III. 1840, 344. Pl. v. fig. 1.—*Leuciscus biguttatus*, DEKAY, Fauna of N. Y. III. 1842, 214.—STORER, Synops. 1846, 161.

From Yellow Creek, a tributary of the Mahoning.—J. P. Kirtland.

2. *CERATICTHYS AMBLOPS*.—*Rutilus amblops*, RAVIN. Ichth. Ohiens. 1820, 51. Falls of the Ohio.—Rafinesque.

3. *CERATICTHYS LEPTOCEPHALUS*.—A species easily to be distinguished from its congener, by its small head which enters four times and a half in the total length. The body itself is proportionally shorter than in *C. amblops* especially. Its scales are likewise larger than in the latter species. The color is of a uniform blackish grey above, and greyish white beneath.

Specimens were collected at Salem, N. C., by J. T. Lineback and School, and preserved in the Museum of the Smithsonian Institution.

NOCOMIS BELLICUS.—It is a more bulky and deeper fish than its congener from Nebraska. And what is still more characteristic, its head is smaller, hence its mouth smaller also. We could not detect the small teeth constituting the inner row, but supposed they got lost in the preparation of the pharyngeal bones. At any rate, whether lost or entirely absent, we have here a second species of the genus *Nocomis*. Color reddish above; reddish yellow beneath, with an obsolete black spot upon the base of the caudal.

Caught in the Black Warrior River, Ala.—Prof. A. Winchell.

Description of the BYSSUS in the genus UNIO.

By ISAAC LRA.

Professor Kirtland published in the American Journal of Science for July, 1840,* some observations he had made on the anatomical and physiological characters of the *Naiades*, and was the first a few years before to have noticed, that at least some species of *Unio*, when very young, were anchored to some foreign substances by "a small silky filament" attached to the foot. I had casually observed the fact in a single instance, in *Unio complanatus* from the Schuylkill, but had not the opportunity of again witnessing it. The Professor followed up his discovery at different periods, and found thus attached the young of the following species; viz., *ryzaz*, *elegans*, *dehucens*, *obovatus*, *crassus*, *foliatus*, *pyramidatus*, *crassidens* and *gibbosus*.

The fact at the time was considered of great interest, and it was very much desired that further observations should have been made. Nothing has, however, to my knowledge, been since published in connexion with the subject neither in this country nor in Europe. M. D'Orbigny discovered in the Rio Parana, South America, a very remarkable fresh water bivalve, which he named

* Page 167 figs. a and b.

Byssanodonta Paranensis, (Voy. dans l'Amerique Merid.) This always remains attached by a *byssus*, proceeding from the foot. It has anterior and posterior adductor muscles.

In the examination of the soft parts of a very large number of species of this family, from Georgia, which I have been enabled to do through the kindness of Bishop Elliott, I have noticed in the *adults* of two small species, a perfect *byssus* attached to the lower portion of the foot, posterior to the base.

In dissecting five specimens of *Unio acutissimus*, nobis, from Etowah River, Georgia, I found in a full grown specimen, one and a quarter inches wide, a large fine *byssus*, fully an inch in length, thicker than a horse hair, quite flattened, semitransparent, and without any appearance of fibre, but rather hornlike. At the point of insertion in the foot, the filament is a little enlarged and rounded, and there is also at the same point the rudiment or remains of a second one. The other extreme end of this filament, where it was attached to the foreign substance to which the animal had anchored itself, is evidently perfect, shewing the true length of the *byssus*. At this end it is divided into four branches, undoubtedly having been attached. Of the five specimens before me, one only has the *byssus* remaining; but it is evident, from the fact that each of the others has a longitudinal cicatrix at the point of the former attachment, that every one had been furnished with a *byssus*.

I found also that the same kind of *byssus* existed in the *adult* of the closely allied species, *Unio Conradicus*, nobis, which accompanied the above from the same locality. There are three of this species, one of which has a portion of the *byssus* attached in the same manner, but evidently broken off and not being more than the fourth of an inch long. This filament is much more delicate than that described above, not being thicker than a human hair. It is not flattened, but rounded. Close to its insertion in the foot is a second one, shorter and probably the remains of a separate filament of attachment, the genus *Pinna* having innumerable fine threads of attachment, the shell itself of one species being sometimes found more than two feet in length.

In all the eight specimens of the two *Uniones* above mentioned, the impressed cut or cicatrix made by the *byssus* is very observable, so that there cannot remain a doubt, but that they had all been attached until they had arrived at adolescence.

As part of these were no doubt anchored when taken from the water, and part of them free and locomotive, it appears that it cannot be necessary to their existence that they should retain their normal condition of attachment.

There are other allied species, forming with these a group, of which *acutissimus* is the type, which I have not had the advantage of examining; but I have no doubt that those will all be found to be also anchored by a *byssus*, in the same manner.

These facts will I hope draw the attention of the Zoologist more closely to observe the habits of this family.

Dr. LeConte, on behalf of the Committee appointed to revise the list of members and correspondents of the Academy, presented a corrected copy of the list; which report was adopted, and the Committee discharged.

The Corresponding Secretary read his report for September.

ELECTION.

Mr. Wm. G. Binney, of Germantown, Dr. Wm. Smith Forbes, and Mr. Wm. Weightman, of Philadelphia, were elected members of the Academy.

October 7th, 1856.

MR. ORD, President, in the Chair.

Letters were read—

From W. G. Binney, dated Germantown, October 5th, 1856, acknowledging his election to membership.

From H. W. Kennedy, dated Buenos Ayres, August 5th, 1856, transmitting specimens for the museum.

On leave granted, Mr. Lea offered the following resolutions, which were unanimously adopted.

Resolved, That the members of the triennial General Convention of the Protestant Episcopal Church, with their families, be invited to visit the Museum on public days, during their session in this city.

Resolved, That an invitation be transmitted to the members of the United States Agricultural Society to visit the Museum on public days, during their session in this city.

October 14th.

DR. BRIDGES, Vice President, in the Chair.

Letters were read—

From the Library Department of the Royal Bavarian Academy of Sciences, dated November, 1855, transmitting donations.

From the Royal Society of Sciences at Upsal, dated August 7th, 1856, acknowledging the receipt of the Journal (Vol. iii. part 2,) and the Proceedings (vol. vii. Nos. 2-7,) of the Academy.

From the Royal Academy of Sciences of Naples, dated March 10th, 1854, accompanying vol. vi. of the Transactions of the Academy.

Dr. Le Conte presented a paper, for publication in the Journal of the Academy, entitled "Synopsis of the Melolonthidæ of the United States, by John L. Le Conte, M. D.;" referred to a Committee consisting of Mr. Schafhirt, Mr. Guex, and Dr. Bridges.

A paper was presented for publication in the Proceedings, entitled "Notice upon the species of the genus *Salmo* of Authors, observed chiefly in California, by Charles Girard, M. D.;" referred to a Committee consisting of Drs. Morris, Hallowell, and Bridges.

Dr. Leidy presented a paper, for publication in the Proceedings, entitled "Notices of extinct Vertebrated animals of New Jersey, collected by Professor Cook, of the State Geological Survey, under the direction of Dr. W. Kittell, by Joseph Leidy, M. D.;" referred to a Committee consisting of Drs. Le Conte, Hallowell, and T. B. Wilson.

Mr. Lea exhibited two specimens of *Uniones*, illustrating his paper on the *Byssus* of the Genus *Unio*, read September 28d.

On leave granted, Mr. Vaux moved that the Academy authorize the publication of the list of members and correspondents recently reported by the Committee appointed to prepare said list; which was so ordered.

October 21st.

MR. ORD, President, in the Chair.

Letters were read—

From the Rev. M. A. De Wolf Howe, Secretary of the House of Clerical and Lay Deputies of the General Convention of the Protestant Episcopal Church, dated October 1856, acknowledging the receipt of an invitation to visit the Museum of the Academy.

From George French Angus, Secretary of the Trustees of the Australian Museum, dated Sydney, New South Wales, May 1st, 1856, offering exchanges. Referred to the Curators with power to act.

From the Hon. W. L. Marcy, Secretary of State, dated Washington, October 1st, 1856, transmitting a collection of Books for the Academy, sent to the Department of State by Charles Huffnagle, Esq., Consul-General of the United States at Calcutta.

From Joseph Barnard Davis, dated Shelton, Staffordshire, October 3d, 1856, acknowledging his election as Correspondent.

The following papers were presented :—

“Descriptions of new species of Birds in the National Museum, Washington, and in the Museum of the Academy of Natural Sciences of Philadelphia, by John Cassin;” referred to a Committee consisting of Drs. Leidy, Bridges, and Wilson.

“Notes on the Reptiles in the collection of the Academy of Natural Sciences of Philadelphia, by Edward Hallowell, M. D.” “Notice of a collection of Reptiles from Kansas and Nebraska, presented to the Academy of Natural Sciences of Philadelphia, by Dr. Hammond, U. S. A., by Edward Hallowell, M. D.” Both referred to a Committee consisting of Messrs. Cassin, Le Conte, and Vaux.

“Notices of Remains of extinct Vertebrated Animals, discovered by Prof. E. Emmons, by Joseph Leidy, M. D.” “Notices of some remains of Fishes, discovered by Dr. Jno. E. Evans, by Joseph Leidy, M. D.” Both referred to a Committee consisting of Dr. Bridges, Mr. Lea and Dr. Le Conte.

October 28th.

DR. BRIDGES, Vice President, in the Chair.

The Committee on Dr. Le Conte's paper, read 14th inst., reported in favor of publication in the Journal of the Academy.

The Committees on Drs. Girard's and Leidy's papers, read 14th inst.; on Mr. Cassin's, and Drs. Hallowell's and Leidy's papers, read 21st inst., severally reported in favor of publication in the Proceedings of the Academy.

Notice upon the Species of the genus SALMO, of authors, observed chiefly in Oregon and California.

By CHARLES GIRARD, M. D.

In the 21st volume of the "Histoire Naturelle des Poissons," published in 1848, Valenciennes subdivides the genus *Salmo* of Artedi, Linnæus, and others into three genera: the salmona proper (*Salmo*), the salmon trouts (*Fario*), and the brook trouts (*Salar*), each characterised by the number and arrangement of the vomerine teeth.

This method we have applied to the species of the present synopsis, which is but an abstract of a more elaborate memoir to be published shortly, accompanied with figures of most of the species.

Needless to say that the observations here recorded have all been made upon specimens preserved in the Museum of the Smithsonian Institution.

The sources whence specimens were obtained, are enumerated under each special heading; all being well known to the lovers and cultivators of Natural History.

—
Genus SALMO, (Artedi), Valenciennes.

GEN. CHAR. Body fusiform; head large; mouth generally deeply cleft, and armed with conspicuous teeth. Pre-maxillary (intermaxillary) bones short and rather situated upon the sides of the snout than upon its extremity; the maxillaries are attached behind them and composed of a single bone. The lower jaw is strong, and terminates frequently into a small knob or tubercle, which, in some species, acquires a very great development. Strong and conical teeth, disposed upon a single row, are implanted upon the dentary. A few teeth on the front of the vomer; none on the shaft of that same bone; a single row of them is also observed along the palatines, and two rows upon the pterygoids and upon the tongue. There is one anterior dorsal fin, followed posteriorly by a small adipose more or less thick. The caudal is well developed, and either truncated posteriorly or slightly emarginated.

SYN. *Salmo*, ARTEDI, Gen. Pisc. ed. Walbaum, 1792, 58.—VALENC. Hist. Nat. Poiss. xxi. 1848, 168.

The scales, on all the species, have that common character of being deprived of those radiating grooves or furrows which extends from the organic centre of the scale to its periphery. The concentric, or lines of growth, are the only ones extant, and, in many instances (in *Salmo* and *Fario*, especially), they are interrupted or else have become obsolete upon the posterior section of the scales. In many instances, also, they have disappeared from the organic centre itself, which, under the microscope, appears perfectly homogeneous. Generally speaking, their outline is subelliptical, elongated in the direction of the longitudinal or horizontal axis of the body. Differences of minor value may be observed in each species.

1. SALMO SCOTLERI, RICH. FAUN. BOR. AMER. iii, 1836, 158 and 223. Pl. xcvi.—DEKAY New Y. Fauna, iii, 1842, 242.—STOREY, Synops. 1848, 194.

The "Ekewan" of the natives of the Columbia river. Is identical with the "Observatory Inlet salmon." A specimen collected by Dr. John S. Newberry, under Lt. W. R. Williamson, in the Des Châtes river, a tributary of the Columbia, O. T.

2. SALMO QUINNAT, RICH. FAUN. BOR. AMER. iii, 1836, 219.—DEKAY, New Y. Fauna, iii, 1842, 242.—STOREY, Synops. 1846, 196.—Common Salmon of Lewis and Clarke.

Body fusiform in profile, compressed. Head forming about the fifth of the entire length. Maxillary bone curved, extending beyond the orbit. Dorsal region olivaceous, studded with irregular black spots; dorsal and caudal fins

similarly spotted. Region beneath the lateral line, unicolor; silvery along the middle of the flanks, and yellowish on the belly. Inferior fins unicolor. Head, above blackish grey, its sides bluish grey.

A specimen from Columbia river, was preserved by Dr. Geo. Suckley, under Gov. I. I. Stevens.

3. *SALMO SPECTABILIS*, GRD.—Body subfusiform in profile, very much compressed, the head forming about the fourth of the total length. Maxillary bone curved, extending to a vertical line passing somewhat posteriorly to the entire orbit. Anterior margin of dorsal fin, a little nearer the extremity of the snout than the base of the caudal. Bluish grey above; silvery beneath. Dorsal region and upper portion of the flanks spread over with light spots.

By its general appearance, this species resembles *Salmo hoodii* most, but may readily be distinguished from it by a more elongated and elliptical head, hence a mouth more deeply cleft, with the maxillary extending further back.

Specimens collected at St. Mary's Mission, Flathead valley, Oregon, by Dr. Geo. Suckley, U. S. A., under Gov. I. I. Stevens.

Genus *FARIO*, Valenc.

GEN. CHAR.—All the characters of the salmons, differing from the latter by the presence of only one row of teeth upon the shaft of the vomer.

SYN. *Fario*, VALENC. Hist. Nat. des Poiss. xxi. 1848, 277.

1. *FARIO AURORA*, GRD.—*Red Char* of LEWIS and CLARKE.—Body fusiform, compressed; head forming the fourth of the length, the caudal fin excluded. Upper jaw longest. Maxillary gently undulating; its posterior extremity extending to a vertical line passing considerably behind the entire orbit. Anterior margin of dorsal fin equidistant between the tip of the snout and the insertion of the caudal. Ground color greyish—silvery above; sides and belly yellowish orange. Dorsal fin spotted.

Specimens collected at Astoria, O. T., by Lt. W. P. Trowbridge, U. S. A.

2. *FARIO TSUPPITCH*, GRD.—*Salmo tsuppitch*, RICH. Faun. Bor. Amer. iii. 1836, 324.—STORER, Synops. 1846, 197.—*Salmon Trout* of the settlers.

Body very much elongated, compressed, fusiform in profile; head forming about the sixth of the total length. Snout rounded, with the jaws subequal. Maxillary gently curved, dilated posteriorly, and extending to a vertical line passing slightly behind the orbit. Anterior margin of dorsal fin nearer the extremity of the snout than the insertion of the caudal fin. Ground color of dorsal region olivaceous, clouded with bluish brown, and scattered about with roundish black spots which extend over the dorsal, the adipose and the caudal fins. Upper surface of head bluish black. Sides and inferior region of the body unicolor, yellowish brown; inferior fins unicolor also. Sides of head yellowish.

A female specimen 26 inches long, caught at Fort Dallas on the Columbia River, Oregon, was skinned and preserved by Dr. Geo. Suckley, U. S. A., under Gov. I. I. Stevens.

3. *FARIO ARGYREUS*, GRD.—Body very much compressed, rather deep upon its middle region and quite tapering posteriorly. Head moderate, constituting the fifth of the entire length. Jaws equal. Maxillary slightly curved; its free extremity extending to a vertical line drawn posteriorly to the orbit. Anterior margin of dorsal fin nearer the extremity of the snout than the insertion of the caudal fin. Bluish grey above; silvery along the middle of the flanks; yellowish white beneath.

This species is quite characteristic in its outline, since it is much more tapering towards the tail than in any other of its congeners. In other respects it resembles somewhat *Fario aurora*, but its elongated and low anal fin will distinguish it from the latter at the very first glance.

Specimens were collected at Cape Flattery, W. T., by Lt. W. P. Trowbridge, U. S. A., and at Fort Steilacoom, Puget Sound, W. T., by Dr. Geo. Suckley, U. S. A.

4. *FARIO GAIRDNERI*, GRD.—*Salmo gairdneri*, RICH. Faun. Bor. Amer. iii, 1836, 221.—DEKAY, New York, Fauna iii, 1843, 243.—STORER, Synops. 1846, 196.—Body fusiform in profile, very compressed; head comprised four times in the length, the caudal fin excluded. Upper jaw longest. Maxillary curved, extending to a vertical line intersecting the posterior rim of the orbit. Anterior margin of dorsal fin equidistant between the extremity of the snout and the base of the caudal. Caudal fin furcated. Back silvery grey; sides silvery, and belly yellowish or whitish. Body obsoletely spotted with black; similar, but more distinct, spots on the dorsal and caudal fins.

A purplish red tint is sometimes apparent over the middle of the flanks.

A specimen collected in Klamath River, O. T., by Dr. John S. Newberry, under Lt. W. R. Williamson, Top. Eng.

5. *FARIO CLARKII*, GRD.—*Salmo clarkii*, RICH. Faun. Bor. Amer. iii, 1836, 224.—STORER, Synops. 1846, 197.

Body fusiform; head well developed, forming the fifth of the total length. Maxillary slightly bent, extending to a vertical line drawn inwardly to the posterior rim of the orbit. Jaws equal. Anterior margin of dorsal fin a little nearer the extremity of the snout than the insertion of the caudal fin. Back bluish grey; upper surface of head blackish grey; sides silvery grey; fins ash grey; dorsal and caudal spotted. Upper regions of head and body studded with irregular black spots or specks.

Specimens collected at Fort Dallas, Columbia River, by Dr. Geo. Suckley, under Gov. I. I. Stevens.

6. *FARIO STELLATUS*, GRD.—*Common trout of the settlers. Opkalloo*, Wasco Indians.

Body elongated and fusiform; head well developed, contained four times and three-quarters in the total length; jaws equal; maxillary gently curved, reaching a vertical line drawn posteriorly to the orbit. Anterior margin of dorsal fin a little nearer to the snout than the insertion of caudal fin. Back light olive; belly light yellowish white. Head, body and fins profusely spotted with black, giving it a very peculiar aspect, easily recognised amongst all the other species of the same genus.

Specimens were collected at Fort Steilacoom by Dr. Geo. Suckley, U. S. A.; at Schoolwater Bay, W. T. by Dr. J. G. Cooper; at Cape Flattery, W. T., Astoria and Humboldt Bay by Lt. W. P. Trowbridge, and in Des Chutes River, O. T., by Dr. John S. Newberry under Lt. Williamson.

Genus *SALAR*, Valenc.

GEN. CHAR.—All the characters of the Salmons, but differing from them as well as from the genus *Fario* in being provided with a double row of teeth upon the shaft of the vomer, and none on the front of that same bone.

SYN. *Salar*, VALENC. Hist. Nat. des Poiss. xxi, 1848, 314.

1. *SALAR LEWISI*, GRD.—Body rather thickish upon its middle region; head moderate, constituting a little less than the fifth of the total length. Lower jaw longest. Maxillary gently curved, its posterior extremity reaching a vertical line drawn immediately behind the orbit. Anterior margin of dorsal fin a little nearer the extremity of the snout than the base of the caudal fin. Ground color of the upper region bluish grey, of the inferior region yellow or orange. The back, peduncle of tail, dorsal, adipose, and caudal fins, spotted with black. The belly and lower fins are unicolor, a deep orange hue existing along the rays and also in the shape of a dot upon the abdominal scales, and which disappears by long standing in alcohol.

This is the trout alluded to in Lewis and Clarke's "Travels." They "caught (at the Falls of the Missouri) half a dozen trout from sixteen to twenty-three

inches long, precisely resembling in form and the position of the fins, the mountain or speckled trout of the United States, except that the specks of the former are of a deep black, while those of the latter are of a red or gold color: they have long sharp teeth on the palate and tongue, and generally a small speck of red on each side behind the front ventral fins; the flesh is of a pale yellowish red, or when in good order, of a rose colored red."—London edition of 1814, p. 192, 4to. And further on, page 487, we read: "The mountain or speckled trout are found in the waters of the Columbia within the mountains; they are the same with those found in the upper part of the Missouri, but are not so abundant in the Columbia as in that river. We never saw this fish below the mountains, but from the transparency and coldness of the Kooskoskee, we should not doubt of its existence in that stream as low as its junction with the south east branch of the Columbia."

It would be an interesting point to compare, side by side, specimens caught in the Columbia, with those of the Missouri river. We should not be surprised if the result of such a comparison should refer the specimens from the basin of the Columbia to *Fario gairdneri*.

Specimens of this species were collected at the Falls of the Missouri River, Rocky Mountains, by Dr. Geo. Suckley, U. S. A., under Gov. L. I. Stevens.

2. *SALAR VIRGINALIS*, GRD.—Body subfusiform in profile, otherwise compressed; head comprised about four times in the length, the caudal fin excluded. Jaws subequal; posterior extremity of maxillary extending to a vertical line intersecting the posterior rim of the orbit. Anterior margin of dorsal nearer the extremity of the snout than the insertion of the caudal fin. Greyish brown above with a purplish reflection and subcircular black spots; beneath, olivaceous, unicolor.

Specimens collected by the party under Lt. Beckwith, in Utah creek, and at Sangre de Cristo Pass, upper waters of the Rio Grande del Norte (Rio Bravo).

3. *SALAR IRIDEA*, GRD.—*Salmo iridea*, GIBBONS, Proc. Cal. Acad. Nat. Sc. i. 1855, 36.—*Salmo rivularis*, AYRES, Proc. Cal. Acad. Nat. Sc. i, 1855, 43.—Body subfusiform in profile, otherwise compressed; head well developed, constituting a little less than the fourth of the total length. Jaws subequal; posterior extremity of maxillary extending a little beyond the orbit. Anterior margin of dorsal fin equidistant between the snout and the insertion of the caudal. Reddish brown above, with small and numerous black spots; yellowish white beneath.

Specimens were collected in the head waters of San Matteo Creek, Cal., by R. D. Cutts; at Petaluma, Cal. by E. Samuels, near Humboldt Bay, by Lt. W. P. Trowbridge, and finally specimens obtained by Dr. Ayres, of San Francisco, under the name of *Salmo rivularis*, proved identical with *Salmo iridea*, of Dr. Gibbons. Dr. Gibbons' description was drawn from a very immature specimen, but has the priority over Dr. Ayres's appellation. The aspect of the male is quite different from that of the female, so that their identification requires a very close study of their intrinsic characters.

Notices of remains of extinct vertebrated animals of New Jersey, collected by Prof. Cook of the State Geological Survey under the direction of Dr. W. Kitchell.

MACROPHOCA, Leidy.

1. *MACROPHOCA ATLANTICA*, Leidy.

Based upon three specimens of molar teeth, obtained by E. Davis, Esq., from the miocene marl of Cumberland County. Genus belonging to the Zeuglodont family.

Crowns of the molar teeth broader than the length, laterally compressed conical; anterior and posterior borders acute, the former with a series of two and the latter with four conical tubercles having denticulated borders; inner and outer

surfaces exceedingly roughened, especially towards the base, by longitudinally acute and broken ridges. Root composed of an antero-posterior pair of fangs confluent half their length. Length of largest tooth $2\frac{1}{2}$ inches; length of crowa 10 lines, breadth $12\frac{1}{2}$ lines.

POLYGONODON, Leidy.

2. POLYGONODON VETUS, Leidy.

Based on a specimen of the crown of a tooth found in the marl (cretaceous) of Burlington Co., by L. T. Germain, Esq.

Length three times the breadth; transverse section elliptical; with trenchant borders; with six planes on one side and seven on the other. Length $1\frac{1}{2}$ inches, breadth $\frac{1}{2}$ an inch. May it be an incisor of *Moscosaurus*?

ISCHYRHIZA, Leidy.

3. ISCHYRHIZA MIRA, Leidy.

Based upon an imperfect specimen of a remarkable tooth apparently of a fish, obtained by L. T. Germain, Esq., from the cretaceous green sand of Burlington County.

Crown of the tooth when perfect, apparently, laterally compressed conical, invested with smooth shining enamel. Fang more robust than the crown, curved pyramidal, quadrate in section, with the base rugged and divided antero-posteriorly. Pulp cavity expanded within the fang, closed below, and narrowing towards the crown. Probable length of tooth when entire about 2 inches; length of fang $10\frac{1}{2}$ lines, breadth of its base 8 lines.

4. SPHYRAXA SPECIOSA, Leidy,

Founded on a specimen of the crown of an anterior tooth obtained by E. Davis, Esq., from the miocene marl of Cumberland County. Posterior border of the crown nearly straight or slightly sigmoid, trenchant border minutely denticulated, sides towards the base striated, apex semi-barbed. Length 4 lines, breadth 2 lines.

EDAPHODON.

5. EDAPHODON MIRIFICUS, Leidy.

Based on eight specimens of upper and lower maxillary bones, found in the Green Sand of New Jersey.

The superior maxillaries are $3\frac{1}{2}$ inches long in the median line and 2 inches wide posteriorly; and they present the matrices of three teeth. The inferior maxillaries are $5\frac{1}{2}$ inches long and $2\frac{1}{2}$ inches deep; and besides the matrices of the three large teeth, they present two or three apparent small ones near the apices of the bones, and another small one to the inner side of the largest tooth.

Notes on the Reptiles in the collection of the Academy of Natural Sciences of Philad^a.

By EDW. HALLOWELL, M. D.

Fam. *GECKOTIDÆ*.

Gen. *HEMIDACTYLUS*, Cuvier, Wagler, Gray, Wiegmann.

Section *DACTYLOPERES* ou a ponce comme tronqués (*Peropus* Wiegmann.)

A. *H. DACTYLOPERES* à lames sous-digitales entières. D. & B.

Duméril and Bibron mention but one species belonging to this division, viz., *Hemidactylus ouallensis*, inhabiting Oualan, Tahiti, Vanicoro and Tongatabou. It differs very materially from the one about to be described. I do not find any species of *Hemidactylus* inhabiting Jamaica in the Catalogue of Reptiles in the British Museum, by Mr. Gray.

HEMIDACTYLUS PRÆSIGNIS, nob.

Char. Mental plate large and triangular; immediately behind it a transverse row of four plates, the two exterior large, the two middle quite small; seven to eight plates margin the upper jaw on each side, and as many the lower; scales upon the abdomen much larger than those upon throat and neck; in the latter regions granular; color brownish above, lighter brown or greyish beneath.

Description. The head is long and rather narrow, depressed in front, covered above with granulations larger upon the front; rostral plate large, somewhat quadrangular in shape; the nostril, which is more or less circular, situated at its upper and external angle; of the seven plates which margin the upper jaw the first appears to be the highest; these plates are all very distinct, and more or less quadrangular; the mental plate is large and triangular, broader than long; there are four plates immediately behind it, the two intermediate very small, the two lateral, which are in contact with the first inferior labial, quite large; the eyes are large, the pupil circular; auricular openings moderate; body moderately stout, covered above with granulations of nearly equal size; tail longer than head, neck and body, rather stout at base, covered above and upon the sides with imbricated scales, presenting below a longitudinal row larger than the others; chin and throat covered with small granulations of nearly equal size; the abdomen is covered with smooth and quite large imbricated scales, contrasting strongly with the small granulations upon the chin and throat; under surface of extremities covered with scales, those of the posterior much larger; granulations above; anterior surface of thighs with scales; the thumbs are deprived of nails, the remaining toes dilated with undivided subdigital laminae; no femoral or anal pores.

Coloration. Uniform brown above, with no lines or spots; lighter brown or greyish beneath.

Dimensions. Length of head 9 lines; greatest breadth 6; length of neck and body to vent 1 inch 8 lines; of tail $3\frac{1}{2}$ inches; of arm 3 lines; of forearm 3; of hands to extremity of longest finger 4; of thigh 6 lines; of leg 4 lines; of feet to extremity of longest toe $5\frac{1}{2}$ lines.

Habitat. Jamaica. Two specimens presented by Caspar W. Pennock, Esq., M.D.

Gen. Remarks. This species differs very much from the only species of *Pero-*
pus heretofore described; among other particulars in the following: It has four scales behind the mental instead of six. In *Ouallensis* there are twenty-four superior labial plates and twenty-six inferior? and the scales upon the under surface of the animal are not represented as unequal in size.

Fam. IGUANIDÆ.

LÉZARDS IGUANIENS OU SAURIENS EUNOTES, Duméril et Bibron.

NOROPS, Wagler.

The following are the characters of the genus *Norops* as given by Duméril and Bibron, (Erpét. Gen. Tome iv. p. 81.)

"Skin beneath the neck forming a salient fold; a sort of small throat pouch without denticulations; neither palatine teeth nor femoral pores. Fourth toe of the foot longer than the third. Scales of the body carinated, in part imbricate; those upon the sides much smaller than upon the back and abdomen. Tail moderate, not prehensile, destitute of crest like the back."

But one species of this genus has been described, viz., *Norops auratus*, from Surinam and other parts of Guiana. The specimen in our collection, received from the Garden of Plants, is from Mexico. The toes are dilated, but not to so great an extent as in many species of *Anolis*. The present species with the same generic characters, is totally destitute of any such dilatation.

NOROPS MACRODACTYLUS, nob.

Char. Scales upon snout tricarinate; those of supra-orbital ridges separated from each other by a row of smaller scales; twelve rows of dorsal scales distinctly carinated; scales upon abdomen carinated; upon flanks very small;

fingers and toes not dilated; color white above and upon abdomen; a lateral vitta passing over the tympanum, extending the whole length of the body.

Description. Head long and narrow, with a marked depression in front; nostrils lateral, in a single scale, about a line from the extremity of the snout, with several rows of small scales immediately behind them; their lower margin is on a line with the exterior ridge projecting over the orbit; the rostral plate is broad and narrow, its upper margin forming an obtuse angle; the scales upon the front part of the head are more or less hexagonal, depressed, tricarinate; the supra-orbital ridge on each side is composed of a ridge of larger scales, separated from each other by a row of smaller ones; eight larger scales upon the orbit; occipital plate quite distinct; six or seven supra-labials; 42 teeth in the upper jaw, the eleven or twelve posterior tricarinate; tongue triangular, smooth, deeply notched behind, very slightly in front, more or less adherent beneath; scales upon the temples subequal; auricular opening of moderate size; body slender, presenting above, twelve rows of distinctly larger scales; about as broad as long, hexagonal, each with a distinct carina extending its whole length. The scales upon the abdomen, of which from sixteen to eighteen rows may be counted, appear somewhat larger than those upon the back, and are also distinctly carinated; the scales upon the flanks are very small, quadrangular, carinated, presenting a very small spine posteriorly; extremities slender; toes not dilated, presenting a row of transverse scales beneath; tail of moderate length; a well marked gular pouch in the larger specimen, commencing at the chin and extending upon the abdomen, (in the smaller specimen, probably a female, this is scarcely visible.)

Coloration. Head, back and upper part of tail white above; abdomen and under part of tail of same color; the gular fold in the larger specimen is dark colored; sides brown, white spotted, a lateral white stripe extending from beneath the eye, along the side of the head, immediately above the tympanum, passing along the side of the neck, about a line above the shoulder, and extending the whole length of the side of the body, and becoming lost upon the tail. The white spots are upon either side of this white lateral line, but in the larger specimen they are absent, and the lateral line is of a brown color and more narrow, the ground color white.

Dimensions. Length of head 6 lines; greatest breadth 3; length of neck and body to vent 14 lines; of tail 1 inch 9 lines; of humerus 3 lines; of arm 3 lines; of hand to extremity of longest finger $2\frac{1}{2}$; of foot to extremity of longest toe 6 lines. Total length 3 inches 5 lines.

Dimensions of a larger specimen. Length of head 7 lines; breadth 4; length of neck and body to vent $1\frac{1}{2}$ inches; of tail ———; of arm $3\frac{1}{2}$ lines; of forearm $3\frac{1}{2}$; of hand to extremity of longest finger $3\frac{1}{2}$ lines; of thigh $5\frac{1}{2}$ lines; of leg $5\frac{1}{2}$; of foot to extremity of longest toe $8\frac{1}{2}$.

Habnat. New Grenada. Two specimens from the Philadelphia Museum in exchange.

Gen. *Anolis*, Daudin.

Char.—"Fingers dilated beneath the anti-penultimate phalanx, forming a sub-oval disk, more or less enlarged, provided with imbricated scaly lamellae; beneath the neck a goitre, which when it is not distended assumes the form of a gular pouch more or less developed; palatine teeth, no pores to the thighs."—D. & B.

The genus *Anolis* is divided by Duméril and Bibron first into two grand divisions, viz., A. with fingers but slightly dilated, constituting the genus *Dracocnura* of Wagler and Wiegmann. This comprises but two species. B. with fingers distinctly dilated, constituting the genus *Dactyloa*. This latter division includes twenty-three species. These are again subdivided into (*a.*) species in which the abdomen is provided with flattened scales, smooth or carinated, and for the most part imbricated, of which there are twenty-two, and (*b.*) species with the abdominal scales granular, of which there is at present known but one, viz. *Anolis camaleonides*.

The subdivision *a.* is again divided into species in which the scales of the

sides are much smaller than those of the back and abdomen, (1 sp.) (b.) In which the scales of the sides are of about the same dimension as those of the back and abdomen; this group is again divided into (a.) species in which the scales upon the upper and lateral parts of the body are mingled with tubercles, (1 sp. *loysiana*,) and (b.) in which the scales of the upper parts and sides of the body are homogeneous or not mingled with tubercles. This last division comprises by far the greater number, viz., twenty species. The genus *Anolis* is exclusively American; of the twenty-five species described by Duméril and Bibron, two are from Surinam; five from Cuba, exclusively; one from Cuba and the United States; one from Cuba and Mexico; one from Cuba and Jamaica; five from Martinique, exclusively; one from Martinique and St. Domingo, one from Chili; two from Brazil; two from the West Indies; one from the island of Tortola; one from St. Domingo, exclusively; one from Cayenne, and one of unknown origin.

Of these twenty-five species of *Anolis*, Duméril and Bibron represent at least one half as entirely new, (1837,) with the exception of two or three previously described by Wiegmann. One has since been described (1851,) by Prof. Aug. Duméril, in the *Catalogue Methodique de la Collection des Reptiles des Museum d'histoire Naturelle de Paris*. (*A. heterodermus* from New Grenada.)

De la Sagra's work on Cuba contains figures of six species viz., *vermiculatus*, *Carolinensis*, *lucius*, *Sagræi*, *Loysiana*, (*A. cantholis*,) *Fernandina* (*Camaliopsis*,) (*A. camalionides*, D. & B.) Daudin has figured two species viz.: *A. lineatus* and *punctatus*. *Anolis velifer* is figured in Guérin *Iconographie du Règne Animal*, Tome 1, pl. 12. The Prince de Wied has figured two species of *Anolis*, viz.: *A. gracilis*, (*nasicus*, D. & B.) and *A. viridis*, *punctatus*, Daudin, according to Duméril and Bibron.

Among the reptiles belonging to this genus in the collection of the Academy, are several well known species, viz.: *Anolis equestris*, (5 sp.) *A. camalionides*, (1.) *A. carolinensis*, (28 sp.) *A. punctatus*, (1 sp.) *A. Edwardsii*, (4 sp.) the last from Jamaica, and others from Cuba, Mexico and Jamaica, which we cannot make out as described in the systems. A number of these were collected in Jamaica at the instigation of my excellent friend, Dr. Caspar W. Pennock, and generously presented by him to the Academy, and others by another friend, Dr. Betton, of Germantown. These are the more valuable, inasmuch as the Herpetology of Jamaica appears to be but incompletely known; but one species of *Anolis* is described by Mr. Gray as inhabiting that island, viz.: *A. stenodactylus*.

ANOLIS (DRACONURA, Wieg.) TROPIDOGASTER, Nob.

Char.—Head of moderate size, covered in front with elevated scales or tubercles of nearly equal size; supraciliary ridges separated from each other by two rows of smaller scales; four or five large uncarinate scales upon each orbit; occipital plate not in contact with the supraciliary ridge; temples covered with small granulations; middle rows of dorsal scales the largest; scales upon abdomen strongly carinated; color brownish, extremities banded with brown.

Description.—This species of *Anolis* is readily distinguished by the remarkably strong carination of the ventral scales, being even more strongly carinated than those of *A. carolinensis*, resembling much the scales of *Phrynosoma cornutum*. The head is of moderate size, snout not prolonged; the rostral plate is broader than long, rounded above; the snout is covered with elevated scales or tubercles, of nearly equal size; the scales upon the front are unequal, tricarinate; this region presents a marked depression, bounded on each side by an indistinct ridge; the supraciliary ridge on each side is constituted by a row of five large and very distinct plates separated from each other in the middle by two rows of smaller scales; there is a group of four or five large uncarinate scales upon each orbit, bordered with others of a smaller size, with numerous granulations exteriorly, and a row of very small plates between these large plates and the supraciliary ridge; occipital plate rather large, irregular in shape, very distinct, separated from the supraciliary ridges by several rows of smooth scales; nostrils lateral, circular

about a line from the extremity of the snout; eight small quadrangular plates margin the upper jaw; 42 teeth may be counted in the upper jaw, the eleven or twelve posterior on each side tricuspid, the intermaxillary very small, the succeeding ones pointed and conical, and considerably larger. 38-40 teeth in the lower jaw, the twelve posterior tricuspid; tongue triangular, more or less adherent beneath, deeply notched posteriorly; temples covered with very small granulations, a little larger above; tympanum of moderate size, scales on the flanks small and granular, much smaller than those upon the back, of which the middle rows are the largest; scales of the back carinated, not very distinctly; those upon the abdomen much larger than those upon the back, quadrangular, and *very strongly carinated*; body and extremities slender; a well developed gular pouch; fingers and toes without any dilatation whatever; third and fourth fingers of equal length, fourth toe much the longest.

Coloration.—Brownish above with a greyish tinge upon the body, extremities banded with brown; abdomen whitish.

Dimensions.—Length of head, 6 lines; greatest breadth, 3; length of neck and body to tail, 13 lines; tail mutilated; length of forearm, $3\frac{1}{2}$ lines; of arm, 3 lines; length of thigh, 5 lines; of leg, 6; of hand to extremity of longest finger, 3 lines; of foot to extremity of longest toe, $7\frac{1}{2}$ lines. An *Anolis resplendens*, D. & B?

Habitat.—New Grenada.

ANOLIS PUNCTATISSIMUS, BOB.

Char. Of moderate size, scales upon supra-orbital ridges separated from each other by smaller polygonal scales; from nine to fifteen carinated polygonal scales upon orbit; a well marked depression upon the occiput; occipital scale separated from supraciliary ridge by four rows of scales; temples granulated; abdominal scales carinated; tail much compressed; color blue or light green, covered above and upon the sides with minute white spots; total length about 6 inches.

Description. Nostrils small, subcircular, their anterior margin about $\frac{1}{2}$ a line from the extremity of the snout; scales upon front polygonal, carinated; those upon the *supraorbital ridge large, carinated, separated from each other by smaller polygonal and more or less carinated scales*; from nine to fifteen or more conglomerated polygonal carinated scales over the orbit, surrounded with granules, the greater number external; a *very well marked depression upon the occiput*; the occipital plate, which is smooth, is subcircular, occupying the bottom of the cavity, and is separated from the supra-orbital ridge by four rows of scales; seven plates upon the upper jaw, the third or fourth quadrangular, and remarkable for its extreme length;* temples granulated, auricular opening suboval, rather large, its posterior edge minutely denticulated; no crest upon neck or body; *scales upon sides granular, those upon back a little larger, especially the three or four rows upon the middle line*; scales upon abdomen with rounded posterior margins, imbricate, *carinated*, much larger than those upon sides and back; *tail much compressed*, larger than head, neck and body, verticillate, covered with carinated scales, the four or five inferior rows much the largest, its superior and inferior margins denticulated; from sixteen to nineteen lateral rows of verticillate scales may be counted, larger than the rest, the posterior extremity of the tail being destitute of them; scales along superior border of thighs and forearms very distinctly carinated; a longitudinal fold under the throat.

Coloration. Snout, front and sides of head whitish, with a tinge of yellow; body above and upon the sides light blue, (probably green during life,) covered all over with white spots; tail yellowish; no black marks or lines upon the body.

Dimensions. Length of head 9 lines; greatest breadth 5; length of body to vent $1\frac{1}{2}$ inches; of anterior extremities to extremity of longest finger 1 inch; of posterior to extremity of longest toe 1 inch 9 lines; of tail $4\frac{1}{2}$ inches; total length $6\frac{1}{2}$ inches.

* Not a constant character; in another specimen eight plates.

Habitat. Jamaica. Three specimens, two adult and one young presented by Dr. Betton.

Gen. Remarks. This species, although it might, with some propriety, be named punctatus, from the great number of small white spots with which it is covered, differs entirely in appearance from the punctatus of Daudin, of which we have one specimen from Surinam. The head in punctatus is much longer, the neck more contracted and the body and tail longer. The scales on the front of the head are smooth in punctatus, carinated in punctatissimus, and their shape and general arrangement are very different; the row of plates above the supra-labials are larger in the former species; the scales upon the flanks are oblong in punctatus, those upon the back flattened; the tail is altogether different; it is subround in punctatus, with smooth scales, without verticillae, and the much larger row of scales along the median line. The one is an inhabitant of Jamaica the other of Surinam and Brazil.

ANOLIS LEUCOCEPHALUS, nob.

Char. Of larger size than usual among the smaller species of Anolis; head much depressed in front, covered with large and smooth polygonal scales; scales of supra-orbital ridge in contact at the middle; temples covered with polygonal scales; upon sides suboval, smooth, larger than those upon back and abdomen, interspaces filled with small granules; abdominal scales smooth; no dorsal crest; tail compressed cyclo-tetragonal at base; color whitish with blotches of green.

Description. Head long and narrow, depressed in front, where it is covered with large and smooth scales, much larger than in most other species of Anolis; scales upon the snout on the contrary very small; nostrils small, suboval, their anterior margin a line from the extremity of the snout, situated on the side of a slight prominence, just within the ridge extending from the anterior margin of the orbit to below the nostril and terminating at its anterior border; the supra-orbital ridge is composed of four or five large scales; they are in contact at their middle, but not anteriorly or posteriorly; the supra-orbital ridge is not prolonged anteriorly, the front, as before stated, being covered with *smooth and large scales*; differing more or less in shape; ten or eleven quadrilateral plates may be counted upon the margin of the upper jaw, 44 teeth in the lower, the ten anterior on each side pointed, the 12 posterior tricuspid; 36 in the upper, eighteen on each side, the ten anterior pointed, the rest tricuspid; tongue slender, deeply notched posteriorly, entire in front, three rows of smooth scales upon the side of the head, between the supra-orbital plates and the anterior orbital ridge; *temples covered with smooth polygonal scales, the superior and posterior rows the largest*; auricular openings of moderate size, suboval, not denticulated; *scales upon the sides suboval, smooth, separated from each other, the interspaces filled with small granules*; these lateral scales are larger than those upon the back and abdomen; those upon the neck and back are more closely united; subround or polygonal; those upon the abdomen for the most part quadrangular, perfectly smooth; no crest upon the back or neck; a large goitre extending from the chin as far as the abdomen; a very large portion of its surface when distended appears to be destitute of scales; the scales upon the under part of the thighs and in front of the arms, as well as upon the under part of the anterior extremities are quite small, having the appearance of granulations; those along the superior margin of the thighs are quite large. Extremities slender; *tail cyclo-tetragonal at base, compressed in the rest of its extent*; longer than head, neck and body, slightly denticulated above, verticillate, seven distinct vertical rows of scales larger than the rest; four or five rows upon the under part of the tail strongly carinated.

Coloration. General color whitish, with blotches of green; abdomen white, with a shade of green; throat yellowish white; in another and smaller specimen the white is more pure and the blotches brown.

Dimensions. Length of head 8 lines; greatest breadth 5 lines; length of body

2 inches 9 lines; of anterior extremities 9 lines; of posterior extremities 1 inch; of tail 3½ inches; total length 6 inches and ¾.

Habitat. Jamaica. One specimen presented by Dr. Caspar W. Pennock, the other without a label.

Gen. Remarks. The scaling of the frontal region is so entirely different from that of the other species of *Anolis* being composed of flat and large polygonal plates, that with the large size of the scales upon the sides of the body, larger than those upon the back and abdomen, being just the reverse of what obtains in most of the other species of *Anolis*, it might, with some degree of propriety be considered as belonging to a subgenus; but as the multiplication of subgenera in our opinion tends only to confusion, and to discourage the young naturalist, and is in fact, at variance with a true and philosophical study of nature, we prefer not making one, leaving it to be placed in a group different from those already recognized, viz., with scales upon the sides larger than those upon the back and abdomen, and larger and flat plates upon the head.

There can be no doubt, we think, that *Anolis leucocephalus* is a species new to Herpetology, the only one closely approaching it being that recently described by Prof. Aug. Duméril, in his *Catalogue Methodique de la Collection des Reptiles du Muséum d'Histoire Naturelle de Paris*, p. 59. (*Anolis heterodermus*, A. Dum.) who observes that the only species of *Anolis* previously described with scales upon the sides, surrounded with small granulations is the *Anolis camæleonides* or *Chamaeleopsis fernandina* of Cocteau figured in de la Sagra's splendid work on the Natural History of Cuba. Mr. Duméril's species is found in New Granada, and differs from *leucocephalus* in having a small denticulated carina upon the neck and back, in its carinated scales upon the tail, in the absence of a large goitre, and the presence of the voluminous scales upon the supra-orbital ridges, and the margins of the snout.

ANOLIS SERICEUS, nob.

Char. Head small, scales upon muzzle carinated; supra-orbital ridges separated from each other by several rows of scales; supra-orbital scales nine in number; temples covered with granulations; scales upon back and abdomen carinated; tail not compressed, long; color brown, extremities banded and blotched with brown; brown bands upon the tail; total length 4½ inches.

Description. The head is small, with a marked depression in front; the nostrils are quite small, circular, about half a line from the extremity of the snout; situated upon the side of a well marked prominence above and within the line of the orbital ridge, which does not extend so far as the nostril; scales upon the muzzle carinated, much smaller than those upon the front, which are subequal, polygonal, the exterior ones larger than those at the bottom of the cavities above mentioned; supra-orbital ridge low, in contact with the supra-orbital scales, and separated from each other by several rows of scales; supra-orbital scales nine in number; occipital scales thickly conglomerated, forming an almost triangular patch with the occipital in the middle, not depressed, and separated from the supra-orbital ridge by a row of three or four scales; temples covered with granulations; nine quadrangular plates upon the upper jaw; auricular openings quite large, suboval, not denticulated; tympanum distinct; body slender without a crest; scales upon the sides granular, smaller than those upon the back, which are imbricate and carinated; those upon the abdomen much larger than those upon the sides and back, quadrangular and very distinctly carinated; extremities slender, covered above with carinated scales, very strongly marked upon the thighs, below with granulations; tail very long, round and thicker at base, not compressed, tapering gradually to a point.

Coloration. Predominant color brown; a small brownish blotch upon the occiput, a much larger one across the neck, commencing behind the auricular openings and interosculating with one upon the anterior portion of the back; extremities banded and blotched with brown; brown bands upon the tail; under parts black, spotted and blotched with brown.

Dimensions.—Length of head 6 lines; greatest breadth 4 lines; length of body

to vent 1 inch 2 lines; of tail 3 inches; of anterior extremities $10\frac{1}{2}$ lines; of posterior $1\frac{1}{2}$ inch. Total length 4 inches 8 lines.

Habitat.—El Euceros le Jalapa, Mexico. One specimen, presented by Mr. Pease.

Gen. Remarks.—In *A. Sagraei* the supra-orbital ridges are in contact.

ANOLIS ACUTUS, nob.

Char.—Head long and slender, with a longitudinal depression in front; snout prolonged, acute, supraciliary ridges in contact; temples granulated; dorsal scales carinated; the two or three middle rows the largest; abdominal scales carinated; tail much compressed; color brownish.

Description.—Head long and slender, with a longitudinal depression in front; snout prolonged, acute, rounded anteriorly; nostrils of moderate size, circular, their anterior margin nearly three-fourths of a line from the snout; they are situated upon a prominence, above and within the extremity of the supra-orbital ridge; scales in the depression immediately behind the nostrils smaller than those upon the snout; behind the latter a double row of large smooth hexagonal scales; these are a continuation of the supra-orbital ridge, which is composed of five or six large and smooth scales, the anterior one the largest; *these ridges are closely in juxtaposition*; the scales at the bottom of the frontal cavity are much smaller than those forming its borders; occipital plate longer than broad, sub-oval, surrounded with scales, its anterior angle almost in contact with the posterior border of the supra-orbital ridges; eight quadrangular plates along the margin of the upper jaw; *three or four rows of scales between the superior marginal labial plates and the supra-orbital ridge*; temples covered with granulations; auricular openings large, circular, not distinctly denticulated; scales upon flanks granular, much smaller than those upon back and abdomen; *dorsal scales carinated*, larger than most of those upon the back; a moderately developed gular pouch extending from the chin to the abdomen; extremities slender; *tail much compressed, except at the base, verticillate*, the verticillae near the root about $1\frac{1}{2}$ lines apart; three or four rows of large and carinated scales beneath the tail; under surface not denticulated, upper very slightly; scales upon superior margin of arms and thighs slightly carinated; posterior surface of thighs covered with granulations.

Coloration. General tint chocolate brown above with a tinge of green; under parts bluish; two brownish lines *en chevron* upon the neck; a brownish interrupted line stretching across the occiput; body brown spotted; snout of a lighter brown.

Dimensions. Length of head 9 lines; greatest breadth 5; length of body to vent $1\frac{1}{2}$ inch; (tail mutilated.)

Habitat. Cuba?

Gen. Remarks. This species would appear to correspond with *A. nasicus*, D. & B., but in that the ventral scales are smooth.

ANOLIS AUGUSTICEPS, nob.

Char. Head long and narrow, temples granulated; scales upon back and abdomen smooth; tail moderately compressed, with a larger row of scales above along the median line; color light pea green, with numerous black spots and undulating lines.

Description. Head long, narrow, snout acute, rounded in front; anterior margin of nostril situated about half a line in front of extremity of the snout; nostrils latero-superior, the prominence, which is usually observed near the extremity of the snout, being in this species scarcely observable; supra-orbital ridge composed of four or five large scales, in contact in front, separated in the middle by three very small scales; occipital plate much longer than broad, surrounded by polygonal scales differing much in size, separated laterally and anteriorly from the supra-orbital ridge on each side by a small plate; eight or nine plates along the margin of the upper jaw, on each side four or five posterior teeth larger than the others; temples covered with granulations; external

openings of the ears small, not denticulated; neck and body without a crest; a moderately developed gular pouch; body slender; flanks covered with granulations smaller than those upon the back, which are smooth; abdominal scales larger than those upon the flanks and back, smooth; tail of moderate length, cyclo-tetragonal at base, moderately compressed, presenting a row of scales above along the median line, much larger than the rest, and below four rows of large scales strongly carinated; extremities slender.

Coloration. General tint light pea green above, with numerous black spots and undulating lines; thighs black spotted posteriorly; head above dusky white; abdomen white; throat white, black spotted.

Dimensions. Length of head 7 lines; greatest breadth 3; length of body to vent 11 lines; (tail mutilated.)

Habitat. Cienfuegos, Cuba. One specimen presented to Mus. Acad. by Capt. Baker.

ANOLIS SACREI, D. & B.

Char.—Scales upon muzzle tricarinate, temples covered with granulations and larger scales; supra-orbital ridges not in contact; occipital plate well defined, suboval, separated from the supra-orbital ridge by three or four rows of scales; dorsal and abdominal scales carinated; tail compressed, a row of scales much larger than the others along the median line above; beneath four rows of larger scales more strongly carinated, the two inferior the largest; Color whitish with a tinge of green or brown. The young with green triangular markings along the back and tail.

Description.—Head small, snout not prolonged, nostrils small, subcircular, about three-fourths of a line from the extremity of the snout; nostrils lateral, situated upon the side of a slight prominence; supra-orbital ridge composed of four or five scales, of which the anterior one is much the largest; this ridge is continuous with a curvilinear one upon the front, uniting with that of the opposite side at the posterior extremity of the snout, at its middle forming the external boundaries of a slight depression upon the front, at the bottom of which are several smaller scales; scales upon the muzzle smaller than those upon the front, tri-carinate; seven supra-orbital scales, four of them quite large, separated from the supra-orbital ridge by a single row of small scales in contact at one point only; occipital plate well developed, suboval, surrounded by small scales, separated from the supra-orbital ridge by three or four rows; supra-orbital ridges not in contact; seven distinct quadrangular plates upon the upper jaw; five upon the lower; temples covered with granulations and larger scales; auricular openings circular, denticulated anteriorly; of moderate size; tympanum distinct; scales upon the flanks quite small, granulated, smaller considerably than those upon the back, which are carinated; abdominal scales quadrangular, carinated, much larger than those upon the back; no crest upon neck or body; extremities slender; tail — (mutilated.) scales carinated, a single dorsal row much larger than the others, four inferior rows larger and more strongly carinated than the other scales; the two middle rows the largest; a small gular pouch.

Coloration.—Above whitish with a tinge of green, blotched with olive; sides marked with white spots and fasciæ; under parts whitish with a tinge of green.

Dimensions.—Length of head 5 lines; greatest breadth 3 lines; length of body 11 lines; of tail —; of anterior extremities 7 lines; of posterior 13½.

Habitat.—Cienfuegos, Cuba. Two specimens presented by Capt. Baker.

In a smaller but more perfect specimen, the tail is longer than the head, neck and body, the former being 1 inch 4 lines in length, the latter 1 inch 8 lines, compressed laterally; in its posterior half very slender, almost filamentary.

Dimensions of a larger specimen. Length of head 7 lines; greatest breadth 4 lines; length of body to vent 1 inch 4½ lines; tail mutilated. The coloration of this specimen is whitish, with narrow brown interrupted bands upon the neck, with brownish longitudinal bands along the flanks, and transverse white spots and fasciæ; extremities banded with brown above; under parts white without spots; in another there are dark triangular spots which coalesce upon the tail

including hexagonal patches of white; extremities banded with olive, under parts white. *Habitat* the same. The specimens thus marked are probably the young, and we are inclined to think are, as well as the larger brown-colored specimens, identical with *Anolis Sagrei*.

Another specimen of intermediate size, characterized by the same difference in form of the scales and granulations upon the temples, tricarinate scales upon the front and muzzle, and carinated scales upon the back and abdomen, presents a coloration very much resembling that of fig. 2, in pl. xiii. of De la Sagra's work, viz., on each side of the body and tail a row of dark-colored undulated markings, and dark-colored bands upon the extremities; but the scales upon the head and body in this figure are not represented as carinated. In *Sagrei*, as before mentioned, the supra-orbital ridges are represented by Duméril and Bibron to be in contact; but in the text of De la Sagra's work, they are represented to be separated by a single row of scales; in our specimens we find one intermediate row of large scales, or two smaller rows, one of which is more or less imperfect.

ANOLIS HETEROLEPIS, nov.

Among the specimens in the collection of the Academy is one which at first, from the triangular markings upon the back, I supposed to be the young of the preceding species, but on a closer examination I find that it differs very materially in the following particulars: 1st. The snout is evidently less acute, more depressed, and is covered with smaller scales; the scales between the supra-orbital ridges anteriorly are much smaller, there being but two rows in *Sagrei* and five in the species now under consideration; the occipital plate is larger; the granulations upon the flanks are much smaller and smooth instead of being carinated, and the ventral scales are smooth, whereas in *Sagrei* they are very distinctly carinated. The tail is considerably longer than the head, neck and body, cyclo-tetragonal at base, compressed in the greater part of its extent, quite slender posteriorly, with transverse rows of larger scales resembling verticillæ, about a line apart; the three or four rows of scales beneath much larger than the others and strongly carinated. The present species differs also in a marked manner from *Sagrei* in having the plate immediately beneath the first infra-labial and behind the mental, much smaller,* this plate being remarkably large in *Sagrei*—and in having the scales upon the chin between the inframaxillary rows of scales much smaller. We propose for this species the name of *Anolis heterolepis*. It is at once distinguished from *angusticeps* by the long and narrow head of the latter.

Coloration.—Light pea green above, with triangular spots of a deeper shade on each side of the median line of the back, the apices touching each other; chin and throat marked with green, presenting in the latter region irregularly longitudinal lines; somewhat similar markings upon the occiput, and a green colored blotch upon each temple; under parts of body and extremities white with a tinge of green, more marked upon the abdomen.

Dimensions.—Length of head $6\frac{1}{2}$ lines; greatest breadth $3\frac{1}{4}$; length of neck and body to vent 13 lines; of tail 2 inches 9 lines. Total length 4 inches $4\frac{1}{2}$ lines.

Habitat.—Cienfuegos, Cuba. One specimen, presented by Capt. Baker.

Adlenda.—In comparing the different species of *Anolis* above described with each other, the following remarks may aid in their future determination:—*equestris*, *cameleonides*, *Edwardii* and *Carolinensis*, are so distinctly characterized as to be readily recognized from the descriptions of authors, more especially of Duméril and Bibron, the admirable descriptions of Bibron of these and the many other species throughout the work being beyond all praise. In *sericeus* the middle dorsal rows of scales are not sensibly larger than the others, and there is no larger row of scales along the middle line of the tail above; the

* This plate is also small in *A. sericeus*.

tail is round—in *Sagrei* it is high and very much compressed, with a dorsal row of larger scales. In *acutus* the scales upon the abdomen are indistinctly carinated, in *tropidogaster* strongly; the scales upon the frontal region are smooth in *acutus*, tricarinate in *tropidogaster*; the supraciliary ridges are closely in contact in *acutus*, separated by two rows of scales in *tropidogaster*. But although these species resemble each other much in color, the most marked point of difference is in the toes, which are dilated in *acutus*, as they most commonly are in the genus *Anolis*, but not in *tropidogaster*. *Angusticeps* is readily recognized by its small size and narrow head; *heterolepis*, by its smooth ventral scales and triangular markings, and the arrangement of scales upon the temples, which are composed of granulations and larger scales, as in *Sagrei*. The two median dorsal rows of scales in *acutus* are sensibly larger than the others, and the two plates behind the mental, beneath the first and second or pre-labials, broader than those which succeed them.

After a careful comparison of the descriptions of the species in Duméril and Bibron, I do not find any which present the same characters as those given above. Besides these, Mr. Gray has described seven species, viz.: *A. occipitalis*, *porcatus*, *flavescens*, *lineatopus*, *stenodactylus*, *reticulatus*, *æneus*. Of these the habitat of *porcatus* is Cuba; that of *æneus*, tropical America. Of the species of which an account is given by me, the most remarkable is *A. leucocephalus*, from the anomalous form of the plates upon the head and the scales upon the body, those upon the sides contrary to what usually obtains, being much larger than those upon the back and abdomen.

ANOLIS ALLIGATOR, Dum. et Bib.

Char.—Head resembling closely that of Alligator; supra-orbital ridges closely in contact; occipital plate in contact with the supra-orbital ridge; scales upon temples of unequal size, with an anterior marginal row of larger scales; two or three middle dorsal rows of scales larger than the others; small granules interspersed between the scales upon the body; ventral scales smooth; no dorsal or caudal crest; tail slender, slightly compressed at its middle; color dark bluish, with black maculations; a black spot beneath each axilla.

Description.—Head not elongated, stout, thick at base, front very slightly ridged, with a depression in the middle, covered as well as the muzzle with rough but not carinated scales; rostral broad and narrow; immediately behind it two large quadrangular plates, with a smaller one between; posterior to this transverse row two longitudinal rows of quadrangular plates; front covered with polygonal plates of unequal size, many of them quite large; nostrils large, subcircular, rather more than half a line from the extremity of the snout, situated within the continuation of the supra-orbital ridge, at the anterior extremity of a slight prominence; supra-orbital ridge composed of five large plates, rough, but not carinated, with two smaller ones behind the anterior by far the largest; the two ridges closely in contact; from five to eight or nine supra-orbital plates not carinated, separated from the supra-orbital ridge by a single row of small scales; occipital plate uneculate, with large scales laterally, smaller ones behind, in contact in front with the supra-orbital ridges; eight quadrilateral plates margin the upper jaw on each side; three rows of scales above the marginal plates, in front of the orbit, the inferior the largest; scales upon the temples of very unequal size, with a distinct anterior marginal row of larger scales; auricular openings rather large, denticulated; body rather stout, covered above with scales elevated in the middle, but not carinated; the two or three middle rows a little longer than the others; scales upon the flanks smaller than those upon the back, but not granulated; each scale upon the body is surrounded by very small and scattered granulations, resembling in size, though not so closely approximated as in *Varanus*; ventral scales smooth, larger considerably than those upon the body, rounded posteriorly; no crest upon neck or back; tail longer than head, neck and body, thick at base, slightly compressed at its middle, very slender except toward base, covered with carinated scales; above a large median row, almost smooth beneath, and of nearly equal size in the specimen examined, except five or six rows on each side, about $5\frac{1}{2}$ lines

from the anus; scales upon the upper part of the thighs very slightly carinated, some of them with a double carina; a gular fold.

Coloration.—Above bluish, with black maculae; under parts lighter, with a tinge of yellow and ferruginous; a black spot beneath each axilla.

Dimensions.—Length of head 8 lines; greatest breadth 5 lines; length of body to vent 1 inch 7 lines; of tail 2 inches 9 lines. Total length 4 inches.

Habitat.—Unknown. One specimen in Museum, belonging to the Green Collection, presented by Dr. Bache.

Gen. Remarks.—This species differs from *Carolinensis* in the less prolonged snout, the absence of the well-marked ridges upon it, the juxtaposition of the supra-orbital ridges, the smooth ventral scales, and in its mode of coloration. The specimen described by Duméril and Bibron was found in Martinique. The general resemblance of the head to that of Alligator is quite striking. According to Duméril and Bibron, who have given an excellent description of this animal, the black markings under the axillae are constant.

ANOLIS CAROLINENSIS.

We have twenty-eight specimens of *Anolis Carolinensis* from Cuba and the southern portion of the United States. These evidently belong to the same species; the specimens differ more or less in color, some being of a beautiful bright green with scarcely any spots, others more or less spotted and lined upon the back, throat and under part of the tail; nearly all have the dark-colored spot upon the temple; three or four of the specimens have a broad white band with irregular edges upon the middle line of the back, constituting a well-marked variety.

Habits The following remarks in regard to the habits of these interesting animals have been communicated to me by a friend in the South, who has had ample opportunities of observing them carefully:

1st. That they drink frequently.

2d. That when they shed they uniformly swallow their exuviae.

3d. That when they happen to break their caudal appendage it is renewed. The growth of the tail, it appears, is more rapid after the broken ends have united. I have myself had for a long time several of these beautiful creatures alive, and they became so tame as whenever a drop of water was presented to them upon the tip of the finger, to leave the part of the twig on which they happened to be and eagerly run up after it, protruding their tongues and lapping very much after the manner of the dog. They change their color, frequently being sometimes more or less brown, but are usually of a light and beautiful pea green. Their favorite food appeared to be flies, which they devoured greedily.

Gen. BRACHYSAURUS, nob.

Char. Head short, covered above with polygonal flattened plates of unequal size; nostrils tubular, in a single plate, near its posterior margin; no distinct occipital plate; a row of broad hexagonal scales over each orbit; a row of large and smooth plates upon the side of the head; no transverse folds upon the neck; scales upon back, sides and abdomen carinated; the dorsal and middle row larger than the others, tectiform; no pores upon thighs or in front of anus.

B. ERYTHROGASTER, nob.

Description. The head is of moderate size, short and thick, rounded above, longer than broad, covered above with polygonal scales of unequal size, uncarinate; the rostral plate is broad and narrow, very slightly elevated; immediately behind it are two triangular plates, with a larger one between them; the nostrils are circular, looking backward and upward, situated near the posterior margin of a quadrangular plate; the supra-orbital ridge on each side is constituted by a row of polygonal scales of unequal size, seven in number, in contact at their middle, there being no intermediate longitudinal row of scales; between the two posterior scales of the supra-orbital ridges are two large quadrangular

scales, with a broad pentagonal one behind them; a few small scales between the large supra-orbital plates—four or five in number—and the supraciliary ridge; five or six narrow quadrangular supra-labial plates, the fourth the longest; a long and smooth plate below the orbit, in front of it five others, the second, counting from the nostril, the highest, the first immediately below the nasal plate; beneath these plates and above the supra-labials a row of smaller plates; eyelids covered with granulations; mental plate triangular, five or six inferior labials; 36 teeth in the upper jaw, the seven or eight posterior tricuspid, the others pointed, conical, the anterior quite small; 40 in the lower, the twelve last tricuspid; a row of small palatine teeth, one on each side; tongue triangular, smooth above, deeply notched posteriorly, very slightly so in front; tympanum circular, of moderate size, somewhat depressed; neck slightly folded upon its sides; body moderately robust, covered for the most part with large scales broader than long, uncarinate, the carinae strongly developed; the median dorsal row larger than the others, tectiform; extremities slender, covered with carinated scales; third and fourth fingers of equal length; fourth toe much the longest; tail cyclo-tetragonal at base; no femoral and no anal pores.

Coloration. Greyish white above, upon head, back and extremities brownish; beneath of same color, except upon chin and throat and sides of abdomen, which are of a beautiful pink red color.

Dimensions. Length of head 8 lines; greatest breadth 6; length of neck and body to vent 1 inch 8 lines; of tail —; of humerus 5 lines; of forearm 4 lines; of hand to extremity of longest finger 6 lines; of femur 6 lines; of tibia 7 lines; of foot to extremity of longest toe 1 inch.

Habitat. New Grenada. One specimen received from Philadelphia Museum in exchange.

Gen. Remarks. The genus above characterized differs from *Sceloporus*, among other particulars in being destitute of femoral pores, in the presence of the row of larger scales along the median line of the back, and in the scaling of the head; from *Proctotretus*, in having carinated and not smooth scales upon the abdomen, as well as in the two last mentioned particulars. In *Ophryessa*, in *Euryalius*, Wagl., and in *Microlophus*, there is a larger row of scales along the median line of the back, and in *Dipsosaurus* also, to which it has little or no other resemblance; but in *Ophryessa* the scaling of the head is quite different, presenting numerous small and rough polygonal tubercles above; the scales upon the back are not so broad, and are much more strongly carinated. *Ophryessa* is a much larger animal, and has a well marked though not elevated crest.

Gen. PROCTOTRETUS, Duméril et Bibron.

Char. Head subpyramido-quadrangular, more or less depressed, cephalic plates moderate, polygonal, occipital in general not very distinct; palatine teeth; neck folded upon the sides, or entirely simple; tympanic membrane slightly depressed; body rounded or slightly depressed, covered with imbricated scales, the superior carinated, the inferior smooth; neither caudal nor dorsal crest; toes simple; tail long and conical, or moderate, slightly depressed; no femoral pores; anal pores in the males.—D. & B.

PROCTOTRETUS NIGER, nob.

Char. Of small size; color black or dark brown above. Scales of moderate dimensions, quadrangular, strongly carinated, the margin of the scales distinct; a fold upon the side of the neck, bifurcating anteriorly; temples covered with scales; post-auricular regions with granulations, and sides of the neck with small scales; a single row of plates above the supra-labials; posterior surface of thighs granulated.

Description. Head small, depressed, with a rather acute snout, covered above with polygonal, unequal scales, not carinated; immediately behind the rostral are three plates, the two external much more extended transversely than the middle; behind these are three others, the two lateral more extended longitudinally, and more narrow than the middle one; exterior to these lateral plates,

and between them and the nasal, are two small quadrilateral ones; immediately behind the middle of the three plates described is a large heptagonal one, with a quadrangular plate situated obliquely, and much more broad than long, on each side, in contact with its antero-lateral facet; on the left side this contact is interrupted by a small supplementary quadrangular plate; the large hexagonal plate occupies the middle of the frontal region, and lies between the two large quadrangular plates, constituting the anterior extremity of the supraciliary ridge; this ridge is composed of eight plates, more or less quadrangular, in contact in the middle, the upper surface of each plate, as well as that of the other plates of the head, presenting numerous vermiculations; the nostrils are subcircular, each in a single plate, nearer its posterior margin; immediately behind the nasal is a very small plate, and immediately below it another, but larger, between it and the single row of plates above the supra-labials; posterior to these two plates are five others of unequal size, occupying the interspace between those just mentioned, and the anterior inferior margin of the orbit; of these the uppermost is the largest; there are five superior labials; the superior surface of the orbits is protected by numerous plates, of which two rows are conspicuously larger than the others, the innermost, the most extended transversely, consisting of four or five large plates, more or less vermiculated upon their upper surface; the external superior border of the orbit is composed of narrow longitudinal plates placed one above another; body slender, covered above and upon the sides with 33 rows of quadrangular carinated scales, the carinae very distinct, those upon the back the strongest, arranged in ten longitudinal and parallel rows, each carina running along the middle of the scale, the margins of which are well defined, but not extending in a point beyond it; auricular opening rather large, a few scales in front; temples covered with scales; a fold upon the neck, bifurcating in front; post-auricular region granulated; immediately posterior to the mental are three or four large and more or less quadrangular plates; extremities slender, upper surface covered with carinated scales; posterior surface of thighs granulated, tail of moderate length, longer than head, neck and body tapering to a point, cyclo-tetragonal at base; posterior margin of anus granulated, the scales immediately behind the granulations smooth; scales of chin, throat, abdomen and under surface of extremities smooth; no transverse fold upon neck; no pores in front of the anus.

Coloration.—Very dark brown, or black above; a very narrow and somewhat indistinct yellow band, commencing at the axilla and extending along the flanks; a broader brownish one and less distinct above; under parts bluish mingled with copper color, with metallic reflections; chin and throat conspicuously black, spotted, the larger spots in front; minute black dots distributed over abdomen and under surface of extremities.

Dimensions.—Length of head $4\frac{1}{2}$ lines; greatest breadth $2\frac{3}{4}$ lines; length of neck and body 1 inch; of tail 1 inch 9 lines; of arm 2 lines; of forearm 2 lines; of hand to extremity of longest finger 3 lines; of thigh $2\frac{3}{4}$ lines; of leg 3 lines; of foot to extremity of longest toe 6 lines; of tail $1\frac{1}{4}$ inch. Total length 3 inches $1\frac{1}{2}$ line.

Hab.—Quinquina Island. A single specimen, presented by W. W. Ruschenberger, M.D., U. S. N.

Gen. Remarks.—The scales in this species are much smaller than in *Proctotretus nigro-maculatus*, *Wiegmanni*, *pictus* or *Chilensis*, being about the size of those of *P. tenuis*, but quite different in shape. It is perhaps the smallest of the *Proctotretes*, and is very readily recognized.

ECPHYMOTES, Cuvier.

ECPHYMOTES TORQUATUS.

A female specimen of *Ecphymotes torquatus* from Buenos Ayres, presented by Dr. A. Kennedy, presents the following appearances, in which it differs from those described. The rostral plate is more extended transversely and is less high; immediately behind the rostral are two large subquadrate plates instead of four

much smaller, and behind these two large subtriangular ones, resembling very much the anterior frontals in many species of serpents; these are separated from the rostral by two narrow plates on each side; posterior to these is a transverse row of five plates, the two external subequal, the middle one long and hexagonal.

Coloration. The black vertical band in front of the shoulder exists, but is not seen upon the upper part of the neck; the general color is olive, without spots or markings distinctly visible; anterior extremities banded in front; no brown marks in front of the anus or upon thighs, these portions of the animal as well as under part of tail being white without any spots whatever. The specimen is largely distended with eggs, one of which measures eight lines in length by five and a half in breadth. A younger specimen from the same locality is more or less spotted with black upon the back, the spots assuming somewhat the form of narrow irregular interrupted bands, upon a ground color of olive; extremities and tail black spotted, inner part of thighs and tail white; black band of neck interrupted in the middle. The plates upon the head in this younger specimen are arranged in the following manner: Four in a transverse row immediately behind the rostral; then two large quadrangular plates; then a transverse row of five, posterior to which is another row of larger plates, the two exterior forming part of the supra-orbital ridge.

URODELA, Duméril.

HEREDIA OREGONENSIS, Girard.

We received a few days ago, with a collection of Crustaceans and Fishes from California, a specimen of a Caducibranchiate Urodele, which appeared to me to me new, and for which it occurred to me the name *Heteroglossa* might be proper to distinguish it from the ordinary *Bolitoglossa*; but in looking into the last number of the Proceedings of the Academy of Natural Sciences, I find a description of a specimen from Oregon, by Mr. C. Girard, which corresponds in so many particulars with it, the chief point of difference being the length of the tail, which is represented as being longer than the head and body, that I hesitate to consider it as new.

Gen. char. Maxillary teeth small; two longitudinal patches of sphenoidal teeth, diverging posteriorly, arranged in oblique rows; a curvilinear series of vomero-palatine teeth on each side, almost in contact posteriorly, passing between the posterior nares and the anterior margin of the orbit, separated from the sphenoidal by an interspace without teeth; tongue supported by a cylindrical pedicel, attached in front; free posteriorly and at the sides; no parotids; toes 4-5.

Sp. char. Size moderate; tail cylindrical; color olive, or brownish yellow, minutely spotted with black above and upon the flanks; under parts Indian yellow.

Description. Head broader than body, truncate anteriorly, nostrils small and wide apart, about half a line from the margin of the upper jaw; eyes prominent, pupil elliptical; gape of the mouth linear throughout the greatest part of its extent; no parotids; no lateral lines of pores along the body; a transverse fold across the neck; maxillary teeth quite small, internal nares of moderate size, ovoid, a series of vomero-palatine teeth on each side meeting posteriorly, presenting the form of an arch, the convexity forward, passing immediately behind the internal nasal opening, between it and the anterior border of the orbit, extending about three-fourths of a line beyond the external margin of the nasal foramen. Two patches of longitudinal sphenoidal teeth, meeting in front, but diverging posteriorly, leaving an interspace in the shape of the letter V reversed; the teeth in these patches are arranged in oblique rows, converging on each side toward the longitudinal interspace between them, and are not closely set; the tongue is obcordate, entire, longer than broad, supported upon a central cylindrical pedicel as in the mushroom-tongued *Urodeles*, but is attached in front at the tip, and by a semi-transparent membrane along its middle as far as the

pedicel, the posterior portion and sides being free; body and extremities slender; four fingers and five toes; first finger very short, the third the longest; first toe quite short, considerably shorter than the fifth, third and fourth of about equal length; two well marked tubercles upon the palms of the hands, the one at the base of the first, the other at the base of the fifth finger; none are observed upon the toes; tail tapering, cylindrical, slightly compressed, not so long as head, neck and body.

Coloration. Brownish above, but on close inspection with a magnifying glass, the whole surface appears to be covered with minute black points upon an olive ground; the sides are also minutely punctated with black; under parts Indian yellow, without spots.

Dimensions. Length of head 5 lines; greatest breadth 4; length of neck and body to vent 1 inch 7 lines; length of tail 1 inch 7 lines; total length 3 inches 7 lines.

Habitat. California? (This Urodele was sent from California without indication of locality, it may therefore have been found in Oregon.) One specimen presented by Mr. George B. Davidson, of the U. C. Survey.

Gen. Remarks. This remarkable Urodele differs greatly in the arrangement of its teeth from Aneides, the rows of which are closely approximated and thickly set, (Fam. Plethodontidæ,) but resembles more closely Spelerpes, but differs from it more especially in the tongue being tied down anteriorly, whereas in the ordinary Bolitoglossidæ it is mushroom-shaped, as the name indicates, and free all around; the tongue in the Bolitoglossidæ is for the most part entire, (in longicauda it is notched posteriorly,) but the minute arrangement of the sphenoidal teeth is different. This animal would appear to belong to the group *Ensatinina* of Mr. Gray, but in *Triton ensatus* (*Ensatina* Escholtzii, Gray,) there are no sphenoidal teeth.

Appendix. Since the above was written my attention has been directed by P. L. Sclater, Esq., of the Zoological Society of London, to the work of Mr. Gosse, entitled a *Naturalist's Sojourn in Jamaica*, by Philip Henry Gosse, F. L. S., &c., London, 1851, in which I find descriptions of the species of *Anolis*, *iodurus* and *opalinus*, (see also *Annals and Magazine of Natural History*, second series, 1850, p. 344, 345.) *Anolis leucocephalus* is identical with *Placopsis ocellata*; Gosse, p. 346. Besides the above, Mr. Gosse has described another species of *Anolis* inhabiting Jamaica, viz., *Draconura catenata*, and two species of *Sphærodactylus*, viz., *S. argus* and *oxyrhinus*. The author gives a very interesting account of the habits of the two species *iodurus* and *opalinus* described by him (p. 220, 227.) A figure is also given of *Anolis*, (*Dactylosa*) *Edwardii*, pl. iv. The reptiles of Jamaica appear for the most part to be specifically distinct from those of Cuba. The following is a comparative list of those enumerated by Duméril and Bibron, Mr. Gray, Mr. Gosse, and others, including those described or mentioned in this paper. To these I have added a list of the reptiles of Martinique, for the habitat of which I am indebted to Duméril and Bibron.

CUBA.

CHELONIA.

CHELOWIADÆ.

*Chelonia mydas.**Chelonia virgata.**Chelonia cucullata.*

TESTUDINIDÆ.

EMYDIDÆ.

*Emys decussata.**Emys rugosa.*

SAURIA.

CROCODYLIDÆ.

*Crocodylus acutus.**Crocodylus rhombifer.*

GECKOTIDÆ.

*Hemidactylus mabouia.**Sphaeriodactylus sputator.**Sphaeriodactylus cinereus.**Gymnodactylus albogularis.*

IGUANIDÆ.

*Cyclura carolinæ.**Anolis equestris.**Anolis sagrei.**Anolis vermiculatus.**Anolis carolinensis.**Anolis trilineatus.**Anolis angusticeps, H.**Anolis heterolepis, H.**Anolis (Acanthoclis) Loryana.**Anolis cambridgei (Hamelia)**Anolis (Hemidactylus) Vernandina.**Holotropis microlophus.**Holotropis vittatus.*

LACERTIDÆ.

Ameiva Auberti.

CHALODRIDÆ.

Amphibatrachus punctatus.

SCINCIDÆ.

Diploglossus sagrei.

OPHIDIÆ.

BOIDÆ.

*Tropidurus melanocephalus.**Leionotus maculatus.**Epicrates anguliferus.**Notophis bicarinatus.*

DIACRANTHERIDÆ.

*Dromicus antillensis.**Dromicus carver.**Dromicus angulifer, (Coluber)**anthracinus.)*

TYPHLOPIDÆ.

*Typhlops lumbialis.**Typhlops richardii.*

BATRACHIA.

HYLIDÆ.

*Hylodes Ricordi.**Trachycephalus marmoratus.**Phyllotates bleekeri.*

BUFOIDÆ.

Bufo poliocephalus.

JAMAICA.

CHELONIA.

CHELOWIADÆ.

Sphargis carolinæ.

TESTUDINIDÆ.

Testudo carbonaria?

EMYDIDÆ.

Emys decussata.

SAURIA.

CROCODYLIDÆ.

Crocodylus acutus.

GECKOTIDÆ.

*Hemidactylus stenodactylus.**Sphaeriodactylus sputator.**Sphaeriodactylus punctatissimus.**Sphaeriodactylus argus, G.**Sphaeriodactylus oxyrhinus, G.**Platydictylus theconyx.*

IGUANIDÆ.

*Anolis Edwardii.**Anolis punctatissimus, H.**Anolis sagrei.**Anolis kodurus, G.**Anolis opalinus, G.**Pleocarpus ovalata, G.**Cyclura Collei.**Cyclura lophoma.*

LACERTIDÆ.

Ameiva Bloanei.

SCINCIDÆ.

*Eumeces Bloanei.**Diploglossus Shawii.*

OPHIDIÆ.

BOIDÆ.

*Chilabothrus inornatus.**Leionotus maculatus.*

LEPTOSOMATIDÆ.

Ischnoglossus DeKayi.

DIACRANTHERIDÆ.

*Dromicus antillensis.**Natrix atra? G.**Natrix callisema? G.**Natrix capistrata? G.*

TYPHLOPIDÆ.

Typhlops lumbialis.

BATRACHIA.

HYLIDÆ.

*Litoria latuola, G.**Trachycephalus lichenatus, G.**Hyla brunnea, G.*

MARTINIQUE.

CHELONIA.

CHELOWIADÆ.

TESTUDINIDÆ.

EMYDIDÆ.

SAURIA.

GECKOTIDÆ.

*Hemidactylus mabouia.**Sphaeriodactylus sputator.**Sphaeriodactylus punctatissimus.**Sphaeriodactylus fastidiosus.**Gymnodactylus albogularis.**Platydictylus theconyx.*

IGUANIDÆ.

*Anolis alligator.**Anolis marmoratus.**Anolis cristatellus.**Anolis vermiculatus.**Anolis lineatus.**Anolis pulchellus.**Anolis chloro cyanus.**Basiliscus mitratus.**Iguana tuberculatus.**Iguana nudiocilla.**Holotropis Hermisleri.**Tropidolepis (Xenolepis) andal-**us.)*

LACERTIDÆ.

*Ameiva Fleli.**Cnemidophorus lemniscatus.**Cnemidophorus axillatus.*

CHALODRIDÆ.

Amphibatrachus carolinæ.

SCINCIDÆ.

*Eumeces mabouia.**Diploglossus Fleli.**Gymnophthalmus quadrilineatus.*

OPHIDIÆ.

BOIDÆ.

Epiplatys carolinæ.

OXYCEPHALIDÆ.

Oxybelus carolinæ.

DIACRANTHERIDÆ.

*Dromicus antillensis.**Dromicus carolinæ.**Dromicus Fleli.*

PSEUDOPHYLIDÆ.

Homalocercus carolinæ.

DIPTERIDÆ.

Diptera carolinæ.

CECOTIDÆ.

Bothrops carolinæ.

BATRACHIA.

HYLIDÆ.

Hylodes martinicensis.

BUFOIDÆ.

Bufo agas.

Hence it would appear, that with the exception of *Emys decussata*, *Crocodylus acutus*, *Sphæriodactylus sputator*, *Anolis Sagrei*, *Leionotus maculatus*, *Dromicus antillensis*, and *Typhlops lumbricalis*, unless several of the others have been incorrectly determined, the species belonging to the Islands Jamaica and Cuba, although but 90 miles distant, are altogether different, and that several of the genera which exist in the one are wanting in the other. Besides the above we have in our collection a small serpent of the size of a Calamarian, with a very short and broad frontal (vertical) plate, a large pre-ocular, no loreal and broad gastrostega, carinated scales and a double row of black spots along the back, from Jamaica, included in the donation of Dr. Penrock, which is identical with *Storeria DeKayi*, B. & G. (*Ischognathus DeKayi*, Dum. et Bib.* With the exception of *Anolis Carolinensis*, the reptiles of Cuba differ in their species altogether from those of the United States, even the southern portion of it; and not only so, but with the exception of *Emys*, *Hylodes* and *Bufo*, and perhaps *Ischognathus*, there does not appear to be even a genus common to the two countries. Were the Herpetology of each of the West India Islands fully known and very accurately determined, many highly interesting and important facts would be developed, tending much to elucidate the laws which govern the geographical distribution of species.

Notice of a Collection of Reptiles from Kansas and Nebraska, presented to the Academy of Natural Sciences, by Dr. Hammond, U. S. A.

By EDW. HALLOWELL, M.D.

Ord. *CHELONIA*, Brog.

Fam. *EMYDIDÆ*, Gray.

ELODITES OU *TORTUES PALUDINES*, Duméril & Bibron.

Five specimens of *Emys pseudo-grographica*, (young.) The shell of the largest of these specimens measures two and a half inches in length, by two inches, five lines in breadth, and is almost orbicular; the carinae upon the vertebral plates are very distinct. Color of carapax olive, with orange colored concentric and irregular lines, most conspicuous when the epidermis is removed; an areola towards the posterior margin of each of the plates; sternum yellowish, marked with irregular dark colored lines; extremities and head and neck marked with longitudinal lines of yellow and black; a curvilinear transverse yellow band on each side, behind the eyes continuous with one running down the neck, and a longitudinal one between the eyes; 24 marginal plates. This species, according to Prof. Holbrook, is found in many of the rivers that empty into the Mississippi, but never east of the Alleghanies.

Ord. *SAURIA*, Brogn.

Fam. *IGUANIDÆ*.

Three specimens of *Crotaphytus collaris*, Holb.

These differ from those from the Creek boundary presented by Dr. Woodhouse, and another large specimen in the collection of the Academy from Arkansas, in wanting the numerous spots with which the latter are covered. The black bands upon the neck and between the shoulders are very distinct; the general color above is blue, more or less deep, with a tinge of green, with transverse bands of white upon the body and tail; deeper bands of blue upon the posterior extremities; under parts white, with dark colored markings under the chin in two of the young; the plates upon the front in all the specimens are, for the most part larger than those upon the muzzle; those constituting the semi-circular ridges along the internal margin of the orbit quite large; occipital plate distinct;

* This species has a wide range, being found in Massachusetts and Georgia. Duméril and Bibron say they have received a specimen from Mexico.

many of the plates (11 or 12,) upon the orbits are much larger than the rest; this difference exists also in the Creek boundary specimens, but is not so well marked; femoral pores very distinct; these in some of the Creek boundary specimens are very large, ($\frac{1}{2}$ a line in diameter,) much larger than in any specimen of *Sceloporus* I have seen; eight eggs quite large, from eight to nine lines in length, were counted in the ovaries of the largest; in which also the femoral pores were very distinct, so that the femoral pores do not belong exclusively to the male in *Crotaphytus*; the stomach which is a large and rounded sac was distended with the debris of grasshoppers and coleopterous insects; one of the former nearly entire.

Habitat.—Arkansas, Louisiana near the confines of Texas, Western Texas, Kansas.

The two specimens of *Holbrookia maculata* (*Cophosaurus* Troschel) do not differ very materially from the many specimens we have from the Creek and Cherokee countries presented by Dr. Woodhouse; the marginal plates upon the upper jaw constituting the delicate fluting in that region are more narrow, and the markings upon the back are more regularly disposed, and the white spots are much less numerous than in some of the Creek specimens. The plates upon the head will be found to vary considerably in individual form and arrangement in the latter.

Habitat.—Creek boundary, Western Texas, New Mexico.

The specimens of *Phrynosoma cornutum* present nothing remarkable; the abdomen and chin of a young one are spotted all over with black spots, and lines of different shapes.

Habitat.—Arkansas, western country from Missouri to Texas, Creek and Cherokee countries, Western Texas, Santa Fe, New Mexico, Kansas.

LACERTIDÆ.

Seven specimens of *Cnemidophorus gularis*, Baird and Girard. These are distinguished from *C. sexlineatus* by the broader stripes and larger size of the scales; the fronto-nasal plates appear also to be comparatively smaller in *gularis*.

Habitat.—Texas, New Mexico and Kansas.

SCINCIDÆ.

Five specimens of *Plestiodon obsoletum*, B. & G.—No two of them are colored precisely alike. They all have a general resemblance, yet each differs from the other. This difference is produced mainly by the greater or less extent to which the scales are spotted with black; in one specimen, the greater part of each scale upon the body being thus spotted; in another, the ground color, which is drab, greatly preponderates; head brown or olive, marked with dark lines and spots, under parts silvery white.

Habitat.—Borders of Rio San Pedro, Texas, Kansas.

CHALCIDIDÆ.

Ophisaurus ventralis, two specimens.

These present different markings; they both are drab colored above, with a brown band running from the occiput along the middle of the back to the extremity of the tail; sides black, with two narrow white vittæ, the upper terminating five inches from the extremity of the tail; the lower on the left side 4 inches 2 lines from the anus; and on the right 1 inch 4 lines; three white lines upon the tail anteriorly; two narrow brown bands on each side of the abdomen. Length of head, neck and body $5\frac{1}{2}$ inches; of tail 1 foot 2 inches. The other specimen is olive above, with a brown band along the middle, but the neck and anterior part of the body is marked with white narrow ocellated spots, and instead of the lateral vitta there are upon the sides on a black ground, three rows of interrupted white spots, often united so as to form a line with very imperfect margins; under surface silvery white; length of head, neck and body $7\frac{1}{2}$ inches; of tail, 1 foot, 5 inches, 4 lines.

A specimen from Verdigris river resembles the first in its markings; another

and very large and stout specimen in the collection of the Academy is black above without any vitta whatever, but marked with transverse longitudinal rows of small spots; in another, the ground color above is brown, and black upon the sides with longitudinal lines of black expanded at intervals, and in these places surrounded with light colored spots, the spots upon the black ground and on the sides much larger; in another, there are longitudinal lines of white spots upon a black ground upon the back, with narrow lines of the same color upon the sides; in another, there are transverse bands of white spots on each side, upon the back, which is of a beautiful light brown, and white spots upon the head, the lateral white lines barred at intervals with cross bars of the same colors, with ten rows of dark brown spots upon the middle of the tail. A specimen from South Carolina is light brown above with lateral rows of darker brown; another from North Carolina is of a uniform drab color above, the scales upon the sides which are greyish marked with numerous black spots of different dimensions and irregular in shape, the abdomen *dark slate color*; under part of tail olive with four longitudinal lines of black spots, so that it will be seen that this species varies much in its mode of coloration. According to Dr. Holbrook, the under surface during life is bright yellow, most remarkable at the abdomen. Duméril and Bibron describe four varieties, including two nominal species, (*punctatus* and *striatulus*), mentioned by Cuvier.

Habitat.—From Southern Virginia to Cape Florida, Alabama, Mississippi, Louisiana, and in many of the States bordering on the Missouri and Ohio rivers. Its Northern range west of the Alleghanies is Michigan, according to Dr. Holbrook.

Ord. OPHIDIA.

SERPENTES INNOCCI.

Fam. CALAMARIDÆ.

The Calamarians belong to the second section or sub-order of Ophidians, the Aglyphodont or Azemlophid Serpents of Duméril and Bibron, characterized as having "recurved, conical, rounded, full and smooth teeth, without cannellation at their points, implanted in both jaws." The serpents belonging to this family have the "body very slender, rounded, and almost of the same thickness from the head to the tail." Duméril and Bibron assert that all the serpents belonging to it are terrestrial, and divide the family into nine genera, distributed in the E. Indies, (*Oligodon* without palatine teeth,) (4 sp.) Java, Sumatra, Borneo and Celebes (*Calamaria*), (12 sp.) Mexico, Cayenne, Surinam, Santa Cruz, Bolivia, New Granada, Java, (*Rabdosoma*), (6 sp.) Cape of Good Hope, (*Homalosoma*), (1 sp.) Celebes, Macassar, (*Rabdion*), (2 sp.) Java, (*Elapoidis*) (1 sp.) Ceylon, and the Philippines, (*Aspidura*), (1 sp.) N. America, (*Carphophis*), (2 sp.) and (*Conocephalus*) (1 sp.) To the two last, originating in N. America, we add the following, contained in the Kansas collection, and which, in its general characters, bears a strong resemblance to *Homalosoma*, but differs from it in the carination of the scales, the acuteness of the snout, the shape of the frontal (vertical) plate, &c.

Gen. MICROPS, nob.

Char. Head small, flattened above and posteriorly, depressed in front; snout acute; nine plates upon the top of the head, the pre-frontal considerably larger than the internasals; frontal plate short, but longer than broad, the two lateral margins nearly straight; nostril in a single plate, near its anterior margin; a frenal, one anterior ocular and two posterior oculars; seven superior labials, the fifth and sixth the largest, the sixth intercalated between the fifth and seventh, the eye resting on the third and fourth; occipital plates margined externally by a row of four or five plates; pupil circular; posterior genials very long, anterior small and transverse; teeth minute, existing both in the palate and maxillaries; scales strongly carinated, except the two inferior rows, elongated, slightly notched posteriorly; gastrostega not ascending high upon the flanks; tail short and pointed, with a double row of scutes.

MICROPS LINEATUS, nob.

Char. Size about the same as that of *Homalosoma lutrix*.

The head is quite small, slightly rounded above, depressed in front; nine plates; snout acute; nostril in a single plate, which is more or less quadrangular, quite near its superior margin, and very much nearer its anterior than its posterior extremity; on the left side this plate is cleft inferiorly below the nostril; a loreal; one anterior orbital; two posterior orbitals; seven superior labials, the eye resting on the third and fourth, the sixth acutely angular, intercalated between the fifth and the seventh, not reaching the margin of the jaw; body slender, thicker in the middle, covered with 19 rows of scales, all of which are very strongly carinated, except the three or four inferior rows, the last being quite smooth and larger than the others; scales with the exception of the three inferior rows on each side narrow, subelliptical, bi-punctate posteriorly, the carina reaching the entire length of the scale; tail short and tapering to a point; abdom. scut. 138. subcaud. 34; a single preanal.

Coloration. Brown above, with three narrow yellow dorsal vittae; the middle occupying one row and half of the adjoining row of scales; head above brown; upper jaw light yellow; abdomen and under part of tail yellow, with a double row of triangular spots of a bluish green color along the middle and base of tail; these spots are sometimes confluent at their bases; the spots beneath the epidermis are perfectly black.

Dimensions. Length of head 4 lines; greatest breadth 2; length of body to vent 7 inches 5 lines; of tail 1 inch 4 lines.

Habitat. Kansas. One specimen in Mus. Acad., presented by Dr. Hammond.

Gen. Remarks. At first sight this serpent might be taken for a young *Tropidonote*, but a close inspection of the frontal and other plates and the shape of the head indicate the difference. It is of nearly the same size as *Homalosoma lutrix* of the Cape of Good Hope, but in that genus the snout is obtuse and the shape of the frontal plate not the same, and that of the scales, which are smooth, is very different; the nasal, however, is in a single plate. In *Ischnoglyphus Dekayi* the frontal plate is broader, the nostrils between two plates, and there is no loreal (*Leptognathien*, D. & B.) In *Conocephalus* the snout is acute, and the frontal plate similar but more narrowed, but there is no pre-ocular and but one post-ocular, a long frenal and the nostril between two plates. In *Streptophorus* (*Leptognathien*) the frontal is broader, the pre-frontals very greatly larger than the inter-nasals; the nostrils between two plates; no pre-ocular, two post-oculars and a long frenal.

Fam. CORYPHODONTIDÆ.

CORYPHODON FLAVIVENTRIS.

Among the reptiles presented to the Academy by Dr. Hammond is one specimen of the *Coluber flaviventris* of Say, (*Say's Expedition to Rocky Mountains*, vol. i, p. 145.) This specimen is olivaceous above, yellow beneath, except upon chin and throat, and along margins of lower jaw, which are white; under part of tail of a lighter yellow than that upon abdomen; seven superior labials, the eye resting on the third and fourth; a small supplementary plate on each side, below the anterior frontal, intercalated between the second and fourth labials; a quadrangular frenal, two post-oculars; nostrils between two plates; plates upon temples as described by Say. 17 rows of smooth elongate scales near the middle of the body; the inferior row the largest; 17 rows upon neck, 15 near the tail; tail of moderate length, longer than in *Ablabes*. 171 abdom. scuta; a bifid preanal; 56 sub-caud. (tail mutilated). Total length 2 ft. 6 inches; of head, neck and body 2 ft.; circumference 2 inches. Say describes the posterior and basal edge of the scales as black, and in one specimen an indistinct double row of reddish brown spots irregularly alternating on each side of the abdomen; these markings are not observed in Dr. Hammond's specimen.

The genus *Coryphodon* of Duméril and Bibron takes its name from two Greek words *Kορυς*, *Cacumen*, summum in quavis re, summit, and *ὄδον*, tooth, in-

dicating the progressive augmentation or length of the teeth as they recede backward, the following being the essential characters as given by the learned authors, Erpet. Gen. Tom. vii. p. 178.

LES CORYPHODONTIENS.

Char. "Serpents with smooth unequal teeth; the anterior much shorter than those which follow, and increasing successively in length from in front posteriorly." They constitute the seventh family of the great sub-order of Aglyphodont Ophidians. The characters of the genus are the same as those of the family. The scales of this genus are more or less elongated, *smooth or carinated*. It is the only one of the family, and comprise six species, inhabiting North and S. America, the E. Indies and the Indian Archipelago, (Sumatra, Philippines). Several serpents have been described under the generic name *Bascanian* by Prof. Baird and Girard, having all *smooth* scales, but as the characters are drawn from the external forms alone and not the *teeth*, and inasmuch as many of these are of secondary importance, and not always constant, this genus, it appears to us, cannot be retained. *e. g.* The head in *Coryphodon pantherinus*, a South American species, is not narrow but broad, the supplementary plate beneath the ant-orbital is absent, and there are but 15 rows of scales, &c. In a specimen of *Coryphodon constrictor* before me, the eye rests on the fourth and fifth superior labial, which is prolonged upward, and the supplementary plate below the large anterior orbital is between the third and fourth upper labials; the same occurs in another specimen belonging to the Bonaparte collection. This arrangement, however, is probably exceptional. In the young specimen found at Beesley's Point, and which does not differ materially in its coloring from that discovered in Kansas, there are but 5 superior labials, the third and fifth greatly prolonged, the eye resting solely on the third, and there are three posterior labials. The external characters of *Masticophis* apply almost equally well to *Psammophis*, an African and Asiatic genus, yet how different the form and arrangement of the teeth in *Masticophis flavigularis* (*Herpetodryas*) and in the latter genus.

Among the specimens is one which appears to be a young *Coryphodon constrictor*; the general coloration resembles very much that of *Ablabes triangulum*, but it is at once distinguished by the shape of the head and the form of the frontal plate. The following are its characters, which may be interesting, showing the great change which age sometimes develops in the coloration of serpents: Head long, flattened above, depressed in front; frontal long and narrow, narrower behind, excavated laterally; eye large, seven superior labials, the eye resting on the third and fourth; nostril between two plates; a more or less quadrangular loreal; one large ant-orbital, very narrow below, broad above, appearing upon the top of the head, between the prefrontal and supraorbital; a small supplementary plate beneath it; two post-oculars; two rows of plates upon each temple between the occipital and superior labials; scales perfectly smooth, 17 rows near the middle of the body; inferior lateral rows the largest. Total length 1 foot $7\frac{1}{2}$ lines; length of head 6 lines; greatest breadth 3; length of tail 3 inches.

Coloration. Head above brown, occipital and frontal plates marked with yellow; chin, throat and superior labials yellow, the posterior edges of the latter black; a red and ash brown circular spot immediately behind the occipital plates; 54 well marked transverse reddish brown blotches upon the back, not reaching to the tail, becoming indistinct in a space of $2\frac{1}{2}$ inches; the lateral extremities of the transverse blotches are separated from the abdominal scutes by four and a half rows of scales; sides covered all over with brown spots; a black spot near the exterior extremity of each abdominal scute, at its posterior margin, and one or more smaller near the middle, upon the anterior part of the abdomen; rest of abdominal surface and of under part of tail yellow, in the latter region almost white. Ab. scut. 171; one bißd præanal; 80 subcaud.

Gen. Remarks. The colors of this animal are so different that it might be readily mistaken for a distinct species. The *Col. vernalis* of Dekay has been

taken for the young of the Constrictor, which hardly differs more in color from the adult than does *Col. vernalis*, but *Col. vernalis* is no doubt the adult age, and appears to belong to a different genus, viz., *Herpetodryas*.

HERPETODRYAS VERNALIS.

Syn. *Col. vernalis*, Dekay *Col. vernalis*, Holbrook, N. Am. Herpet. vol. 3, p. 79. *Chlorosoma vernalis*, Baird and Girard, Cat. N. Am. Serp. p. 108.

Two specimens. These do not differ from the other well known individuals. This serpent has a wide range, being found in New York, Maine, Pennsylvania, Wisconsin, Massachusetts, (Baird & Girard,) Connecticut, (Holb.) We have one specimen from Rhode Island presented by Mr. S. Powell. Wagler gives as the type of his genus *Chlorosoma* the *Coluber viridissimus* of Linnæus, (habitat Surinam,) which is a serpent about three feet in length, the *Col. vernalis* a little more than one. The two serpents belong to different families, the one being an Isodontian, according to Duméril and Bibron's arrangement, having the teeth smooth, alike, equally spaced, and the head larger than the neck, and is innocuous, the other belonging to the suborder of Opistoglyphes, having one or more posterior teeth longer and channelled, and is venomous. (Fam. Dipsadens.) The *Col. viridissimus* of Linnæus (*Chlorosoma viridissimum*, Wagler,) belongs to the genus *Dryophylax* of Duméril and Bibron, characterized as having the "head conical, rather long, but little distinct from the trunk, in which the inferior region is separated from the flanks by a more or less salient line which the gastrostega form toward their extremities; tail usually long, tapering and rather slender; eyes of the ordinary size, pupil round, subcaudal; scutes bifid." (Tome vii. p. 1103.) Duméril and Bibron state that they do not retain the generic name of *Chlorosoma* of Wagler, he not having characterized it with sufficient precision. In *Dryophylax viridissimus* the eye rests on the fourth and fifth superior labials, (third and fourth in *vernalis*.) there is but one anterior orbital, (two in *vernalis*.) and there is no loreal, the posterior frontals passing down alongside of the head to join the superior labials. There is but one temporal plate, (three in *vernalis*.) and there are eight superior labials, (seven in *vernalis*;) tail 9 inches 8 lines in *viridissimus*, 3 inches 4 lines in *vernalis*.

Sub-Gen. ELAPHIS, Aldrovandi.

Char. "Head usually but little distinct from the body, and for the most part slightly conical, with a snout inclined a little downward; trunk almost always cylindrical; sides of the abdomen but little angular; scales of the trunk strongly or feebly carinated."—D. et B.

ELAPHIS ALLEGHANIENSIS.

Syn. *Scotophis Alleghaniensis*, B. & G.

Two specimens. The coloration of these corresponds very well with the descriptions of *Coluber Alleghaniensis* by Prof. Holbrook, of *Scotophis Alleghaniensis*, by Baird and Girard, except that the posterior part of the abdomen and under part of tail is not uniformly slate black, being tinged to a certain extent with yellow; the number of superior marginal labial plates in these specimens is eight, the seventh the largest; the two inferior rows only appear to be smooth, except upon the neck, (according to Holbrook four, and Baird and Girard seven;) near the occiput the scales are perfectly smooth. Total length 3 feet 8½ inches, (Fr.); of tail 5½ inches; of another 3 feet 6½; of tail 5½. Abdom. scut. 221 in one; 1 bifid preanal; 66 subcaudal; in the other, ab. scut. 227; subcaudal 175. Circumference of first specimen at its middle 3 inches 7 lines; of second 2 inches 4 lines. Subcaudal scutes larger in the larger specimen.

The genus *Elaphis* appears to be very well characterized, and comprehends, according to Duméril and Bibron, thirteen species distributed in various parts of the world—Montevideo, (pleurostictus,) borders of the Caspian, Persia, S. Europe, Japan, (virgatus,) N. America, islands south of Japan, (conspicillatus.) It is one of the very few genera of serpents common to Europe and America.

The species inhabiting the United States are *Elaphis Alleghaniensis*, *guttatus*, *quadrivittatus* and *vulpinus*; three others have been described by Duméril and Bibron, viz., *E. spiloides*, *rubriceps* and *Holbrookii*; and Profs. Baird and Girard describe also three, viz., *Scotophis Lindheimeri*, *confinis*, *lætus*; the only specimens of these we have at present in our collection beside the three first enumerated, are two of *vulpinus*, presented by Dr. Gavin Watson, from the neighborhood of Buffalo, New York, which are readily determined from the description of Baird and Girard, and which undoubtedly belong to the genus *Elaphis*, which, according to Duméril and Bibron, was established by Aldrovandi in 1640 for the *quadri-radiatus* of Gmelin, (*Elaphis (cervone.) Elaphis Holbrookii* is represented as without spots or bands upon the flanks.

The geographical range of *Alleghaniensis*, according to Prof. Holbrook, is the Blue Ridge, Virginia, Highlands of the Hudson, N. Y., and Mountains of Carolina, and according to Profs. Baird and Girard, Carlisle, Penna., Creek boundary, (Hallowell.)

ABLATES, D. & B.

Char.—"Colubri-form serpents with a moderate head, generally somewhat distinct from the trunk, which is almost cylindrical; abdomen separated from the flanks by an angle but little salient, the scuta being scarcely elevated upon the sides; snout short, smooth and rounded; eyes rather small; tail of moderate length, somewhat tapering; scales of the trunk rhomboidal, for the most part short and without carinae."—D. & B.

ABLATES TRIANGULUM. Var. CALLIGASTER.

Among the collection of reptiles presented by Dr. Hammond, are three snakes resembling the *Coluber eximius* of Dekay, but which differ in the markings about the head, in the general color, but more especially in the number of scales, there being but twenty-one rows in *eximius*, and from twenty to twenty-seven, (20 towards the tail and 25 upon the neck,) in one of these specimens; 25 in the others. The blotches upon the back, of which there are fifty, are more narrow than in that species, their external margins being separated from the abdominal scutes by seven rows of scales; the blotches are from three to five lines in length by eight in breadth: there are eighteen transverse spots upon the tail; two rows of lateral spots, the superior much larger than the inferior; the head is long, the frontal (vertical) plate longer than broad, the gape of the mouth extensive, the eye resting on the 4th and 5th superior labials in advance of the middle of the gape; scales perfectly smooth, more narrow and elongate than in *eximius*; 210 abdom. scut. 1 bifid præanal; 65 subcaudal; total length 2 feet 7 inches, (Fr.); of tail 5 inches 3 lines; another 2 feet 6½ inches, and a third, 2 feet 8½ inches in length; in another 206 ab. scut.; a single præanal, 243 subcaud.; and in a third 198 abdom. scut. one single præanal and 41 subcaudal. These numbers agree sufficiently well with those of *calligaster*, as given by Harlan, viz. abdom. 213, caudal 52, (Med. & Phys. Research. p. 122.) whereas in *eximius* the abdominal plates, according to Harlan, run as high as 250 in number. Dr. Holbrook, however, gives 198 abdom., 1 præanal, 247 subcaudal, and Harlan states that in a living one which he observed, there were only 33 pair of caudal scutes. In Professor Baird and Girard's specimens of *eximius*, the number of abdominal plates varied from 200 to 214, and the abdominal from 49 to 55; the total length from 2 feet 4½ inches to 3 feet 10 inches, corresponding in this respect with Harlan's description of *calligaster*, which he says was about 4 feet long; so that there does not appear to be any material difference between the *eximius* of Dekay, and the specimens under consideration, either in the number of plates or in the length of the animal, but chiefly, as before stated, in the greater number of rows of scales of the latter; in all Profs. Baird and Girard's specimens of *eximius*, and in those of the Academy, the number being but 21. There can be little doubt, we think, that the specimens from Kansas are identical with the *calligaster* of Say, for Dr. Harlan, who appears to have first described those in the Philadelphia Museum, is of opinion that they may be a variety of *eximius*. Prof. Holbrook,

who examined the originals of Say, states that they are the same, differing only in the greater number of plates in calligaster; but it is quite possible that he may not have counted the rows of scales. In all of the Kansas specimens, the coloration of the head and neck is different from that usually observed in *eximius*, and in two of them entirely so, there being in each two dark brown longitudinal blotches upon the temples, and on the neck, one on each side, and another about half the length of these between them, the triangular spots described by Lacepède, being altogether absent. Ground color of head above brown, with no white stripes or bands, but a band of dark brown extending across the posterior margin of the pre-frontal plates. The ground color of the body and tail above is brown, the transverse spots or blotches much darker, each with a slight margin of a lighter brown than the ground color; the blotches are more narrow than in *eximius*, occupying from two to three rows of scales only in length, and from eight to ten in breadth; 45 in one, (the 45th opposite the anus,) upon the body; 18 upon the tail; 47 in another; and 18 upon the tail, and in a third 49; the 49th opposite the anus, and 14 upon the tail; blotches upon tail quite narrow, minutely black spotted and maculated, as well as interspaces and sides; color of abdomen as in *eximius*. Notwithstanding the great resemblance in the number of abdominal and subcaudal plates, and general appearance, we are inclined to consider the above specimens as belonging to a variety distinct from *eximius*, being, in fact, the calligaster of Say. We have recently received from Kimball's Museum, Boston, (whether the originals of Say had been transferred,) through Dr. Holbrook, one of the originals of Say's calligaster: the tail is broken off with a small portion of the body, but it corresponds with Dr. Harlan's description, and Prof. Holbrook's notice of it, the scales, of which there are twenty-five rows, being perfectly smooth. We therefore have a confirmation of the statement of Prof. Holbrook, of the specific identity of *eximius* and calligaster, and of the opinion of Dumeril and Bibron, who place it, as well as *clericus*, among the synonyms of *Ablabes triangulum*, and I am happy to agree with those learned and very eminent Herpetologists.

The following may be given as the characters of *Albates triangulum*, var. *calligaster*.

Char.—Head rather long; seven superior labials; body of moderate thickness, with from 25 to 27 rows of smooth scales; tail about 1-6th of the total length; color brown above, with from 45 to 49 rows of black transverse narrow blotches upon back and 14 to 18 upon tail; two lateral rows of smaller blotches upon sides; under part of body beautifully tessellated with black and white; abdom. scut. 198, 210, subcaudal 41, 65; length 2 feet 6½, 8 feet 8½ and 3 feet 10 inches, (Fr.)

Geographical Distribution.—Kansas, Missouri.

Gen. Remarks.—Dumeril and Bibron state that the name *triangulum* has precedence over that of *eximius* of Dekay, having been applied to the same species by Count Lacepède, in his *Hist. des Serpens*, published in 1789. Tome, 2, p. 311. The description of Lacepède is very precise, but it appears to us that it applies, not to the *eximius* as usually described, but rather to the *clericus* of Baird and Girard. The description of Lacepède is as follows: "Nous nommons ainsi (triangle) cette espèce de couleuvre parce qu'on voit sur le sommet de la tête, qui est garni de neuf grandes écailles une tache triangulaire chargée dans le milieu d'une autre tache triangulaire plus petite et d'une couleur beaucoup plus claire ou quelquefois plus foncée; des écailles unies et en losange couvrent le dessus du corps, qui est blanchâtre avec des taches rousses irrégulières et bordées de noir; on voit un rang de petites taches de chaque côté du dos et une tache noire allongée, et placée obliquement derrière chaque œil." The length of Count Lacepède's specimen was 2 feet 7 inches 2 lines, tail 3 inches. Abdom. sc. 213, subcaud. 48 pair. There can be no doubt therefore of the priority of Lacepède's description which is very accurate, but inasmuch as but one row of lateral spots is mentioned, there is some doubt whether it applies to *eximius* or to the serpent described by Baird and Girard, having only one row of lateral spots, (*Ophibius clericus*.) We have a number of specimens with but a single row of

lateral spots with transverse blotches much broader, and reaching to the abdominal rows of scales, but in which the size and position of the eyes do not appear to form constant characters. The blotches in a recent specimen are of a bright red, a very inappropriate color for a clercius, according to our present notions. The specimens marked *eximius* are all immature, with one exception, but all have the double row of spots.

ABLAKES TRIANGULUM, var. CLERICUS]

Char.—A large triangular red blotch upon posterior part of head and neck, with a smaller one of a lighter color in the middle; a black band from the eye to the angle of the mouth; 27 rows of quadrate blotches upon the back, of a bright red color bordered with black, the 27th opposite the anus; eight upon the tail; the blotches upon the back separated from the abdominal scuta by a row and one half of scales, and sometimes reaching as far as the last row; a single row of much smaller lateral spots of a red color bordered with black, intermediate as respects the position of the larger ones, occupying the last or abdominal row of scales, and a portion of the abdominal plates; 21 rows of scales; abdom. scut. 196, præanal single, subcaud. 44; circumference 2 inches 7 lines. Total length 2 feet 7½ inches, of tail 3 inches 11 lines.

It will be observed that these characters differ very little from those given by Count Lacepède.

Habitat.—Clark county, Virginia, Mississippi and neighborhood of Haddonfield, New Jersey.

For description of var. *eximius*,* see Dr. Holbrook's work, N. American Herpet., vol. 3, p. 69.

The geographical range of *eximius*, according to Prof. Holbrook, is Maine, Rhode Island, Massachusetts, Pennsylvania, Maryland, Illinois, and high up the Missouri, (calligaster, Say,) and New York, (Prof. Baird.)

Gen. TANTILLA, B. and G.

Among the Ophidians of Dr. Hammond's collection is a very small Calamarian, resembling in its general appearance *Carphophis amena*, Dum. and Bib., but much more slender and of a lighter brown color. The arrangement of the plates upon the head, however, is quite different, and I cannot find a genus into which to place it, among those of the Calamarians characterized by Dum. and Bibron, in the Catalogue of North American Serpents of Baird and Girard, unless it be *Tantilla*, or of the snakes in the British Museum, by Mr. Gray. The following are its characters:—Head small, slightly rounded above, depressed in front; snout smooth, rounded, nine plates upon the top of the head, the two anterior frontals much smaller than the posterior, which pass down on each side of the head between the posterior nasal and the anterior orbital plates, and are in contact with the superior labials; nostrils between two plates, situated in the anterior of the two for the most part, at its posterior edge; vertical or frontal plate short and broad, hexagonal, the posterior angle much more acute than the anterior; occipitals rather long, pentagonal; the supraciliaries do not project over the eye; but two temporal plates; no loreal, the posterior frontal taking the place of it; one ant-orbital and one post-orbital, the latter somewhat larger than the former; six superior labials, the eye resting on the third and fourth, the fourth, fifth and sixth much larger than the preceding ones; eye small; six inferior labials, the fourth the largest; body slender, somewhat thicker near the middle, with 15 rows of smooth and rhomboidal scales; five longitudinal rows of smooth rhomboidal scales, four scales in each beneath the neck, between the posterior genæal and front abdominal scutes; three inferior lateral rows of scales larger

*Dr. DeKay says of the *eximius*, "it is rare to find them exceeding 4 feet; the more usual length is about two."

than the others; color light brown or olive above, lighter beneath, approaching to white, a narrow dark colored line along the middle of the back, commencing at the occiput; head of a darker brown than the rest of body; ab. scut. 130; one single preanal and 42 bifid sub-caud.

Dimensions. Length of head 3 lines; greatest breadth 2; length of neck and body 5 inches; of tail 1 inch $6\frac{1}{2}$ lines; total length 6 inches $2\frac{1}{2}$ lines.

Habitat. Kansas.

Gen. Remarks. This serpent corresponds very closely with *Tantilla* of Baird and Girard, and may be their *Tantilla gracilis*, which, however, wants the vertebral line. In their species the posterior frontal do not come in contact with the labials and the vertical plate is represented as anteriorly acute. The number of rows of smooth scales, of orbital plates and abdominal and sub-caudal scutes agree very well, there being 129 of the former and 45 of the latter.

We do not find, however, that the inferior row of scales is considerably broader than the others, if indeed so broad as the row above it.

Habitat. Indianola.

CORONELLA LAURENTI, 1768.

Char. "Serpents with posterior superior maxillary teeth longer and on the same line with the others, without interval; trunk elongated; scales smooth; snout rounded and but little elongated." D. & B.

CORONELLA DOLIATA, var.

There is one specimen of *Coronella doliata*, one foot three inches in length; and two specimens resembling the *Calamaria elapsoides* of Holbrook, which appear to be the young of the former. They do not belong to the genus *Calamaria*, which has but one nasal plate and no frenal, *elapsoides* having no frenal and the nostril between two plates. We have also in the collection of the Academy a specimen marked *elapsoides* from the Creek boundary, which, however, has a loreal plate and is no doubt a young *coronella*. The following notes may characterize sufficiently these specimens: *Cor. doliata*, adult. Head resembling that of *Elaps*; vertical (frontal) plate a little longer than broad; two lines in breadth; occipitals short; pre-frontals (posterior frontals) much larger than the inter-nasals (ant. frontals); nostrils between two plates; a small and narrow frenal; one anterior and two posterior oculars, seven superior labials, the eye resting on the third and fourth; 21 rows of smooth, quadrangular, elongated scales; tail short, 3 inches 3 lines in length. Abdom. scut. 200; one single preanal; 52 subcaudal.

Coloration. Twenty-nine red spots upon the back, bordered with black; interspaces between the black bands white; the red spots are for the most part more narrow in the middle, more extended laterally; the black bands occasionally almost touching each other; the black bands coalesce with black, sub-quadrates upon the abdomen, having other black spots intermediate; a black, transverse band across the occipital plates; a few black spots upon the upper labials; ground colour below light yellow; the black bands upon the back are from two to two and a half lines measured longitudinally, being about thrice the dimensions of those of a specimen from Delaware. The red spots or transverse bands occupy from two to two and a half rows of scales, as do also the black bands upon the margins. In the specimen from Delaware the red spots occupy a much greater space, the first comprising 11 rows of scales, but 6 in the Kansas specimen; the second six, in the Kansas specimen three, and the black margins are also much more narrow, occupying $1\frac{1}{2}$ rows of scales; the black tessellated markings upon the abdomen also differ, and the alternate black spots are not seen except towards the tail; the snout is more acute, and the number of rows of scales is less, viz.: 19. Ab. scuta 186; one single preanal; and 42 sub-caudal.

In the specimens of *Ophibolus gracilis*, B. and G., the anterior black rings so extend as to cover the whole head above, except the very tips; in other specimens the black rings run into each other. In another there were only 21 pairs

of rings. They are from Arkansas and Louisiana; number of rows of scales not mentioned, (Cat. N. Am. Reptiles in Smith. Inst. p. 91). *Ophibolus* is not characterized with sufficient precision to be retained, including as it does two genera, *Ablabes* and *Coronella*, belonging to different families, the one (*Ablabes*) an *Isodontian*, with teeth of equal length, the other (*Coronella*) a *syncraterian*, (posterior teeth in the latter much larger and stronger than those which precede them, a well marked character in our specimens). The one from Delaware corresponds very well with Prof. Holbrook's *Coronella doliata*, though the rings are not so generally confluent with the spots upon the abdomen.

In one of the younger specimens, one $9\frac{1}{2}$ the other $7\frac{3}{4}$ inches in length, the red blotches are much wider apart, the black rings more narrow in proportion and the white interspaces wider than in the other. The black rings in rows, in these specimens entirely surround the abdomen. (We need for the thorough elucidation of the natural history of the *Coronellians* resembling each other so much in color, a greater number of specimens and of all ages. Our friends would confer a favor upon science would they take care, as has been the case to a great extent in the Kansas collection, to send us numerous specimens of the same species.)

Gen. Remarks. The coloration of this serpent differs very considerably from that of the figure of *Ophibolus gentilis*, B. and G., in the exploration of the Red river of Louisiana, by Capt. Randolph B. Marcy and George B. McClellan. The blotches in that figure are much more extended, and the black marginal rings much wider apart. In one of these specimens there were 25 instead of 29 pairs of black rings, the red portion occupying a much greater space; but in another there were 28; dorsal row of scales 21; Ab. scut. 198; sub-caud. 45; total length 20 inches. These black ringed *Coronellians* will probably, when a sufficient number of specimens shall have been procured from different parts of the Union to determine the question, turn out to be for the most part varieties of one and the same species.

Gen. *TROPIDONOTUS*, Kuhl.

The genus *Tropidonotus* belongs to the family of *Syncraterians* of Dum. and Bibron, in which the teeth are in a continuous row without interval, and the posterior longer than the others; the scales in this genus, as its name indicates, are always carinated, more especially those upon the flanks. The tail is of moderate length. Three species in the collection belong to this genus, viz.: *Tropidonotus parietalis* of Say, of which there are three fine specimens; a much larger one, (*Trop. obliquus*.) and *Trop. ordinatus*.

TROPIDONOTUS PARIETALIS, Say.

The collection made by Dr. Hammond includes two specimens of *Tropidonotus parietalis*. Both these serpents correspond with the short but clear description of Say. The red spots on the sides are very apparent; one of the specimens is quite stout, the circumference being $3\frac{1}{4}$ inches at the middle; 147 abdom. scut. a single præanal, (tail mutilated) 19 rows of scales, the inferior row smooth, the middle stripe broad, occupying one and the half of each adjoining row of scales. In the smaller specimen, Ab. sc. 155., and 83 sub-caudal; tail of moderate length, rather long and tapering.

Habitat. Between San Antonio, El Paso, Missonri (Say); Kansas, California, (Dr. Heermann); Rio San Pedro, Texas, (Woodhouse.)

There is but one specimen of *Tropidonotus ordinatus* (young) with the lateral stripes very distinct, three rows of alternate black spots; extremities of abdominal scales black spotted anteriorly; occipital plates bi-punctate; 21 rows of scales all carinated, inferior row largest; ab. sc. 167, a single præanal, 78 sub-caudal. Total length, 1 foot 1 inch 7 lines, of tail $3\frac{1}{4}$ inches.

TROPIDONOTUS OBLIQUUS, nob.

Char. Head long, flattened above, nostril between two plates, a loreal, other plates normal, 8 superior labials, the eye resting on the 4th and 5th, 6th and 7th

the largest; immediately behind the middle post-ocular one temporal plate between the occipital and the superior labials; 23 rows of carinated scales, the inferior row but slightly carinated and larger than the others; scales strongly emarginate posteriorly, the carinae running the whole length of the scale; scales long and rather narrow upon the back, broader towards the abdomen. 140 ab. sc. 1 bifid preanal, and 69 sub caudal; tail rather long, tapering to a point; body robust, size about that of *Tr. sipedon*.

Coloration. Greyish above, with large transverse and more or less oblique blotches of the same color bordered with black, extending as far as the abdominal scales; they are quite broad, occupying about five rows of scales, and have very irregular margins; the interspaces between them are comparatively very narrow, from a scale to nearly two in width; 32 of these oblique blotches may be counted, the 32d opposite the anus; 18 or 19 transverse brownish bands upon the tail; under surface resembling very much that of *sipedon*, the ground color yellow, which predominates greatly at the anterior part; throat and under jaws quite yellow, the posterior margins of the inferior labials bordered with brown.

Dimensions. Length of head 1 inch 5 lines; greatest breadth 9; length of body 2 feet, 1 inch, 7 lines; of tail 8 inches; total length, 2 feet, 10 inches, 1 line; circumference 3 inches, 1 line.

Gen. Remarks.—This serpent differs from *Trop. rhombifer* and *transversus*. It resembles very much a specimen in the possession of Dr. Holbrook from Chicago, sent to him some time ago by Prof. Kirtland, and which he has kindly permitted me to examine. They both are of the same length, have similar markings, and the same number of rows of scales. It may be a variety of *Trop. sipedon*.

HETERODON NASICUS.

There are three specimens of *Heterodon nasicus* B. and G., in very excellent preservation. These *Heterodons* are remarkable for their prominent rostral plate and bulging cheeks, giving them a physiognomy, to use the expression of Prof. Schlegel, quite different from that of our ordinary *Heterodons*. The abdomen and under part of tail is almost entirely black. In two of the specimens the vertical (frontal) plate is as broad as long, in one broader by about half a line; the shape of the vertical plate differs entirely from that of *simus*, but much more from that of *niger* and *platyrhynus*. In a specimen of *simus* there are eight small plates between the frontal and rostral, and the anterior nasal and supero-nasals; in *nasicus* fourteen, in *platyrhynus* and *niger* there is but one, (the *azygos*) immediately behind the rostral. In a specimen of *niger* there is but one loreal plate, the posterior supra-nasal (posterior frontal) passing down upon the side to take the place of the upper one in *simus*; and in *platyrhynus* two. The entire length of the largest of these specimens of *nasicus* is one foot, three inches, tail 2 inches 7 lines, circumference 1 inch 7 lines. It appears to be a smaller species than *simus*, and much smaller than *platyrhynus* and *niger*. Prof. Baird and Girard, however, give over two feet as the dimensions of a specimen from Sonora. Ab. sc. 137, 1 bifid preanal, 43 sub-caudal. In 2d. 137, ab. sc. sub-caud. 43. In 3d, 137, ab. sc. sub-caud. 44.

Habit. Rio Grande, Red River, Arkansas, Fort Webster, Sonora.

Gen. Remarks. The figure in Capt. Marcy's report does not accurately represent this animal; the bulging of the cheeks, a prominent characteristic, is not sufficiently shown, and the nostril is in a single plate, which is not the case.

VENENOSI.

TRIGONOCEPHALUS CONTORTRIX.

There are four specimens of *Trigonocephalus contortrix*, which present nothing very peculiar. In one of them the black color predominates greatly upon the abdomen; dorsal rows of scales near the middle in all 23. In a fine specimen from Pottsville, Pa., presented by Mr. C. T. Hughes, the dorsal rows are but 21,

ab. sc. 146; a single præanal, 38 sub-caud. followed by 7 bifid near the posterior extremity of the tail; in the Pottsville specimen, 148 ab. sc. 1 bifid near the anus, 21 single and 20 bifid plates at the end of the tail. In a 2d 142, ab. sc. 1 bifid near the anus, 25 single and 21 bifid. In all the specimens the sub-caudal scales are single anteriorly and bifid posteriorly. The *Trigonocephali*, like the *Crotali*, have a deep pit between the eye and the nostril, in which they differ from the *Vipers*. They have plates upon the head, unlike *Bothrops* and several other genera, and are destitute of rattles. This serpent was first described by Linnæus under the name *Boa contortrix*; and afterwards by Pallasot de Beauvois, who calls it *Angistrodon mokeson*. It has been placed in no less than five different genera, viz.: *Boa*, *Angistrodon*, *Cenchris*, *Scytalus*, and *Trigonocephalus*, with three different specific names.

Habitat. This serpent has a very wide geographical range. From N. England to Florida, and the shores of the Atlantic to Alleghanies, (Holbrook) Ohio, Penn., S. Carolina, Louisiana, Texas, (B. and G.)

CROTALUS CONFLUENTUS.

There is one specimen of *Orotalus*, which corresponds sufficiently well with Say's description of *Orotalus confluentus*. The spots are more crowded together anteriorly than in the specimen described in Sitgreave's report; the interspaces between the first fourteen being much more indistinct than between those which follow, especially the first seven which present the appearance of narrow white transverse bands; they are confluent only to a slight extent. Total length including rattle, 1 foot 8½ inches; of tail including rattle 1 inch 8 lines; of rattle 9 lines; (4 rattles and terminal appendage) of head 1 inch, breadth ¾; 25 or 27 rows of scales. 178 ab. sc., a single præanal, 1 bifid, 14 single and 2 bifid sub-caudal, the last near the rattle; circumference 2 inches. 40 brown subquadrate spots, more or less margined, may be counted upon the back and four or five upon the tail; the last nine or ten have more the appearance of bars than regular blotches. A much larger *Orotalus* than the above is found in California, of which an excellent figure is given in Capt. Marcy's *Exploration of Red River*, pl. 1, under the name of *Orotalus confluentus*. We have several in the collection of the Academy, presented by Dr. Heermann, of which a notice will be given in the forthcoming volume of the Pacific Railroad report, under the direction of Capt. Williamson. These are of a yellowish color beneath, with brownish maculations; the subquadrate spots upon the back a deep brown bordered with orange. One of these specimens measures more than 3 feet in length; 23 rows of scales. The predominating color in the specimens, except that of the dorsal subquadrate blotches, is sulphur yellow. The name of *Orotalus Lecontei* might perhaps with propriety be given to this species from California, and that of *confluentus* be retained for the smaller *crotalus* with quadrate blotches, from Missouri and Kansas. The serpent figured in the *Exploration of Red River*, has more the general appearance of the former, and the shape of the rattle corresponds, this in *confluentus* tapering to a point; and not quad-rangular as in the larger animal.

RANIDÆ.

There is in the collection a specimen of *Rana halecina*, which does not differ in any important particular from the *R. halecina* found in the neighborhood of Philadelphia, unless it be that in the latter the internal nares appear to be larger, and the tongue more narrow. The vocal vesicles are quite distinct, the pores upon the orbit conglomerated and very apparent; others are observed upon the neck and anterior part of the back, and a band extends along the upper margin of each flank, from the posterior angle of the eye to near the thigh; Duméril and Bibron state, that it is with some doubt that they separate this species (the *halecina*,) from *palustris*, but admit that they are, and they are no doubt distinct. They are both very common in the neighborhood of Philadelphia. The *Rana halecina* has vocal vesicles, the *palustris* has none; the

spots as Duméril and Bibron observe, are subquadrate in palustris, but round in halecina; the thighs are very differently marked in the two species, and the tympanum, as stated by the authors above mentioned, is smaller in palustris, but it appears to us that the snout is more acute in the latter than in halecina, being the reverse of the diagnosis as given by them.

RANA PIPIENS.

There is but one specimen of *Rana pipiens* in the collection, and that is about half grown. It does not differ materially from one of the same dimensions from Absecon, N. J., except in the size of the tympanum, which in the Kansas specimen is not more than $2\frac{1}{2}$ lines in diameter; whereas in the one found at Absecon it is 6 lines, being the same as in a very large and full grown specimen from Buffalo, New York. The general color is olive above, minutely and sparsely spotted with black, with very indistinct bars of a deeper olive upon the posterior extremities. The mottlings below resemble each other, except that in the Absecon specimen they are of a chocolate color, and the color of the abdomen less clouded; they both appear to be females. The difference in the size of the tympanum is certainly remarkable, but without a greater number of specimens, we are unwilling, on that account, to give it a new specific name. Besides the above, there are several other smaller specimens of the same olive color above, the rows upon the posterior extremities of a darker color, the body covered with minute black spots, in the youngest resembling the *R. conspersa* of Major Le Conte, which is, probably, the young of *R. pipiens*. According to Major Le Conte, *conspersa* wants the ridge upon the tympanum. Under part mottled as in the larger individual.

There is a single specimen of a very small Batrachian resembling the *Acris gryllus*, grey spotted above with the triangular spots upon the head; thighs and eyes obliquely spotted with brown; under parts white; length from snout to posterior extremity of body 6 lines; length of anterior extremities 3 lines; of posterior $9\frac{1}{4}$.

BUFONIDÆ.

BUFO AMERICANUS.

There are in the collection of Dr. Hammond, two very large toads, larger than any specimens of *Bufo americanus* that I have seen. They measure 3 inches 11 lines in length, (from snout to vent,) the dimensions of the *Bufo americanus*, as given by Prof. Holbrook, being but $2\frac{1}{2}$ inches. The longitudinal ridges upon the head are as in *Americanus*, and there is a narrow vertebral line running from the extremity of the snout to near the posterior extremity of the body; the general color is dusky above mingled with olive, with a few subround black spots and linear maculations; the black colored maculations are more distinct upon the sides; under part yellow, mingled with orange posteriorly; the warts upon the sides of the body above and upon the posterior extremities are remarkable for their large size.

The *Bufo punctatus* of Profs. Baird and Girard appears to be the young of this species; they are of an ash grey with subround spots, and irregular markings of black, containing one or more prominent red colored points or tubercles. Under parts white, with a tinge of blue upon the abdomen, except posteriorly, the under surface of the posterior extremities of a yellow color. I cannot make out that this toad differs essentially from *Bufo americanus*, and in this my friend Major Le Conte agrees, who also examined the specimen.

The most striking difference between this species and the *Americanus*, consists in the much greater breadth of the tongue, and its greater comparative evertility; in two specimens of equal size, the tongue in the Kansas specimen is six lines in breadth, in *Bufo Americanus* but three. In the largest specimen the tongue measures 7 lines in breadth, and is somewhat less evertile than in the smaller specimen. This species is very different from *Bufo halophila*, B. & G., inhabiting California; the latter is much more warty, the warts being

very numerous and much developed along the middle of the back; the markings beneath are also different, halophila being largely maculated beneath.

ENGYSTOMA OLIVACEUM, nob.

There is a single specimen of *Engystoma*, one inch one line in length by seven lines in breadth; the anterior extremities 6; the posterior 1 inch 10 lines in length. The general color above is olive, with dark colored spots posteriorly; these are observed in considerable number upon the posterior part of the body and upper part of the thighs; a few also are seen over the shoulders; the sides are obscurely marbled with brown; under surface yellow, immaculate; a well marked fold passes across the head behind the eyes, extending down alongside of the head.

This specimen is larger than any of those in the collection of the Academy, and the coloration is quite different from that of Dr. Holbrook's figure (*N. Am. Herpet. vol. v. pl. vi.*) and the specimens from Georgia in the collection presented by Maj. Le Conte. These are all more or less mottled with brown beneath and brown or chestnut colored above.

Dimensions. As above, length of tarsus and toes 9 lines; of leg 4 lines; of thigh 4; of arm 2, of forearm 2.

Gen. Remarks. Duméril and Bibron describe five species of *Engystoma*—two from N. America, (*carolinense* and *rugosum*.) two from S. America, (*ovale* and *microps*.) and one from Malabar, (*ornatum*.)

Habitat. According to Dr. Holbrook, *Engystoma Carolinense* has never been found north of Charleston, its range extending westward to the lower Mississippi.

URODELA.

AMBYSTOMIDÆ.

AMBYSTOMA LURIDUM, var. *FASCIATUM*.

There is but one specimen of *Urodela*, viz., an *Ambystoma*. This is the same animal apparently figured in Duméril and Bibron's work, pl. 105, under the name *Ambystoma abades*, (*variété*.) but it differs entirely from *Ambystoma fasciatum*, (*opacum*.) not only in coloring but in the arrangement of the teeth; these in *fasciatum* are placed in three distinct groups, whereas in the present specimen they are in a continuous series, forming a very obtuse angle, the lateral prolongations passing behind the internal nares and terminating in a line with their external margin, presenting the same arrangement as in *Ambystoma luridum*, of which it is probably a variety, having nothing to distinguish it from that species but the coloration. Duméril and Bibron state that their specimen was received from the neighborhood of New Orleans.

One cannot but remark, in studying the collection of reptiles above noticed, the great difference in the geographical range of the genera and species composing it. The *Emys* does not exist with us, neither does a single one of the genera of the lizards, unless it be *Onemidophorus*. Of the innocuous serpents four are common to Pennsylvania and Kansas, viz., *Elaphis Alleghaniensis*, *Ablabes triangulum*, *Tropidonotus ordinatus* and *Herpetodryas vernalis*. The others, viz., *Tropidonotus parietalis*, unless it be considered a climatal variety of *sitalis*, *Tropidonotus obliquus*, *Microps lineatus*, *Coryphodon flaviventris*, *Coronella dolliata*, *Tantilla gracilis* and *Heterodon nasicus* are unknown to us. The genera of innocuous serpents in the collection common to Pennsylvania and Kansas, are *Elaphis*, *Ablabes*, *Tropidonotus*, *Coryphodon* and *Heterodon*. Of the venomous serpents, *Trigonocephalus contortrix*, which is one of the most widely diffused of our serpents exists in both regions, but *Crotalus confluentus* is found only in the far west and south-western portions of North America. Of the *Ranidæ*, *R. halerina* and *piplens* are common to both, and of the *Bufo* *B. Americanus*; but we have no *Engystoma*, and among the *Urodela* no *Ambystoma*, with an arrangement of teeth and system of coloration in all respects

similar to the specimen in the collection, which appears to us, as above mentioned, to be closely allied to *luridum*.

We have not at present the materials for a complete representation of the Herpetological fauna of America either North or South, but these will hereafter no doubt present some very curious results, when compared with the fauna of the West India Islands, and other parts of the globe. In order, however, to arrive at the truth in a matter so important, it will be necessary to determine with the utmost precision the characters both of the genera and species, and this cannot be done without a knowledge of the anatomy, as well as of the external forms.

Descriptions and Notes on Birds in the Collection of the Academy of Natural Sciences of Philadelphia and in the National Museum, Washington.

By JOHN CASSIN.

1. *BUTEO COOPERI*, nobis.

About the size of *Buteo borealis*. Bill strong, edges of upper mandible lobed, wings long, quills wide, fourth quill longest, tail moderate, legs rather long, tarsi feathered in front slightly below the joint, behind and remainder in front naked, with about 13 transverse scales in front and 11 behind.

Total length (skin) 21½ inches, wing 15, tail 9 inches.

Tail white at base, external feathers with their outer webs cinereous and their inner webs white mottled with cinereous, other feathers of the tail mottled and striped longitudinally with white, bright rufous, dark brown and cinereous, darker on the outer webs. A subterminal transverse band of dark brown, tip white.

Plumage of the head above white at base, tipped, and with longitudinal stripes of brownish black; back and rump brownish black, upper tail coverts white, transversely barred with dark brown and tinged with rufous, wing coverts and quills cinereous darker on outer webs of primaries and lighter on their exposed ends. Under parts white, with narrow stripes of dark brown, numerous on the neck, throat and flanks. (breast, abdomen and under tail coverts pure white,) a few of the same on the under wing coverts, tibiae faintly tinged with yellowish. Bill dark bluish, tarsi yellow.

Obs. This is the young plumage, and the present specimen is the only one that I have ever seen. It is from California, and is in the collection made by Dr. J. G. Cooper, while attached to Lieut. Williamson's party that surveyed a route for a railroad to the Pacific Ocean.

This bird belongs to the same group as *Buteo cythonotus* of South America, and has nearly the same light cinereous color of the wings, quite different from any other North American species. I have named it in honor of Dr. Cooper, a talented and active young naturalist, the son of William Cooper, Esq., one of the most eminent of American Naturalists.

2. *EUPALTRIA CINEREA*, nobis.

Bill thick and rather long, distinctly notched near the end, wing rather long, first quill spurious, fourth slightly longest, tail moderate, tarsi and toes slender, feathers of the head above slightly lengthened.

Total length (of skin) 5 inches, wing 2½, tail 2 inches.

Entire upper parts cinereous, feathers on the head with faint lines of brown on the shafts. Quills dark ashy brown, edged externally with pale ashy, tail dark ashy brown, narrowly tipped with white. Throat and abdomen white, breast pale ashy, under wing coverts white. Obscure line from the bill to the eye, and ring around the latter, white, spot in front of the eye, dark ashy brown. Bill dark, base of lower mandible white, feet dark.

Hab. Moonda river, Western Africa. Discovered by Mr. P. B. DuChaillu.

Obs. This little bird is nearer the genus *Eupaltria*, than any other that I can find at present, though perhaps not strictly. Two specimens in the collection of Mr. DuChaillu are all that I have seen. It is a plain little bird, having the general appearance of *Uruba* and *Eupaltria*.

3. *SITTA ACULEATA*, nobis.

About the same size as *Sitta carolinensis* and much resembling it, but with the bill longer and much more slender. The colors of the upper parts are darker than in *S. carolinensis*, and the white of the tail of less extent.

Hab. California. Specimen in Nat. Mus. Washington, and Mus. Acad., Philadelphia.

Obs. This is the western style of *Sitta*, nearly allied to the common species of the States on the Atlantic. It may very readily be distinguished by its long, slender and pointed bill, which is a constant and unvarying character. Numerous specimens are in the collections above referred to, and it appears to be a common bird of the western regions of North America.

4. *TODIRAMPHUS VARIUS*, (Eyton,) Auctorum.

Halcyon varia, Eyton, Proc. Zool. Soc., London, 1839, p. 101.

Blyth Jour. As. Soc. Bengal, xv., p. 11.

Whatever may be the bird described by Mr. Eyton as above, it is quite certain that Mr. Blyth as cited, describes *Halcyon concreta*, Temm. Pl. Col. iv., pl. 346. The latter describes at length, and the species can readily be identified with Temminck's plate, even without specimens. We regard it as quite probable, too, that Mr. Eyton alludes to the same bird, and at present regard his name as a synonyme for *Halcyon concreta*.

This bird does not belong to the genus *Todiramphus*.

5. *COLUMBA IRIDITORQUES*, nobis.

About the size of *Turtur eythrophrys*. Wing rather long, quills broad, second quill longest, tail rather short, feathers broad, legs short.

Total length (of skin, male) about 10½ inches, wing 6½, tail 4 inches. Female smaller.

Neck behind with a wide collar of cinnamon color, with golden violet and green metallic lustre. Entire head cinereous, light on the throat and in front, darker and with a green metallic lustre on the occiput, other upper parts very dark, nearly black with a tinge of cinereous, and on the back and rump with green and violet metallic lustre, especially next to the nuchal collar. Under parts vinaceous, under tail coverts light chestnut, under wing coverts dark cinereous. Two central tail feathers dark cinereous, others same color on their outer webs, and dark chestnut on their inner webs, and widely tipped with yellowish white. Legs yellow.

Hab. St. Paul's river and Moonda river, Western Africa. Dr. MacDowell's collection and Mr. DuChaillu's collection. Spec. in Mus. Acad. Philada.

Obs. This handsome species of Dove has been in the collection of the Academy for some years, having been collected by Dr. MacDowell, but I have never succeeded in finding a name for it. It is not given in the *Columbidae* of the Prince Bonaparte's Conspectus Avium.

Several specimens are in Mr. DuChaillu's collections. This species does not intimately resemble any other known to me, and may be immediately recognized by its wide nuchal collar, the colors of which are very brilliant. The back and rump and some of the wing coverts have also brilliant metallic lustre.

6. *ZAPORNIA UMBRINA*, nobis.

"*Zapornia spillinota*, Gould," Peale, Voy. Vincennes, Birds, p. 224.

About the size of *Z. spilnotata*, Gould. Bill rather long, membrane of the nostril very large, wing rather long, third quill longest, tertiaries long, tail short, legs moderate, toes long.

Total length (skin) 5½ inches, wing 3, tail 2 inches.

Entire upper parts reddish brown or snuff color, darkest on the rump, which color is continued on the sides below the lower edges of the wings. Under parts dark cinereous, lighter on the throat, under tail coverts brownish black with transverse stripes of white, under wing coverts brown edged with white, feet light colored, bill darker.

Hab. Feejee Islands. Specimens in the collection of the U. S. Exploring Expedition, (Vincennes and Peacock.)

Obs. This bird was given in Mr. Peale's volume on the Birds and Quadrupeds of Capt. Wilkes's Expedition, as *Zapornia spilonota*, Gould, but though very probably of the same genus, is distinct, and we have not found it described.

7. *TACHYPETER PALMERSTONI*, (Gmelin.)

Pelecanus Palmerstoni, Gm. Syst. Nat. i. p. 573, (1788.)

Obs. This is a species quite distinct from *T. aquila*, and is apparently exclusively an inhabitant of the Pacific Ocean. From that species the present bird may readily be distinguished by its much larger gular pouch, which in the living bird is of a red color. Its quills and tail feathers are much narrower and the latter is longer. So far as can be determined from preserved specimens, the two species are nearly of the same size, though the present bird is the more slender.

Numerous specimens are in the collection of the Exploring Expedition, (Vincennes and Peacock.)

Notices of Remains of Extinct Vertebrated Animals discovered by Professor E. Emmons.

By JOSEPH LEIDY, M. D.

CETACEA.

1. *ORYCTERO CETUS CORNU TIDENS*, Leidy.

O. quadratidens, Proc. A. N. S. VII, 378.

The genus was originally proposed on several long horn-like teeth, together with fragments of jaws found in the miocene deposit of Virginia. Prof. Emmons has also discovered a tooth, apparently of the same species, in the miocene deposit of North Carolina. The tooth bears a wonderful resemblance to the horn of a young ox. It is nearly 5 inches long in the curve and over an inch in diameter at base, which is hollowed into a deep conical cavity, as in the spermaceti whale.

SAURIA.

2. *DREPANODON IMPAR*, Leidy.

This species is founded on the crown of a tooth discovered by Prof. Emmons in the miocene deposit of Cape Fear, North Carolina.

The specimen, in form, bears a strong resemblance to the crown of the inferior canine tooth of a bear, but it has only one trenchant ridge, and this is situated postero-internally. The enamel is thin and smooth; the base of the crown is hollowed conically. Length of specimen 10 lines; breadth at base antero-posteriorly 7 lines, transversely 5 lines.

3. *PLIOGONODON PRISCUS*, Leidy.

Founded on two much mutilated specimens, consisting of the crowns of teeth, discovered by Professor Emmons in a miocene deposit of Cape Fear, in North Carolina.

Teeth elongated conical, nearly straight or only slightly curved inwardly, in section circular, with a pair of opposed carinae on the inner side; surfaces divided into numerous narrow planes, with a few vertical interrupted plicæ, which are more numerous on the inner side. Enamel finely wrinkled; and the dentine concentric. Base of crown hollowed. Probable length of crown when perfect 2 inches, breadth of base $\frac{1}{2}$ of an inch.

The teeth differ from those of *Mosasaurus* in their narrower proportion, straightness, circular section, and plicæ of the enamel; from those of *Polyptychodon* in the possession of divisional planes and opposed carinae; and from those of *Plesiosaurus* in the former character and the circular section.

4. *PALMOSAURUS*? (*COMPOSACRUS*) *PRISCUS*, Leidy: ante p. 165.

Half a dozen isolated teeth of this saurian are contained in the collection of Prof. Emmons.

5. *OMOSAURUS PERPLEXUS*, Leidy.

An enaliosaurian, based upon a number of teeth of varied character, vertebræ, fragments of ribs and other bones, and the impression of a dermal plate, obtained from the coal field of Chatham Co., North Carolina, by Prof. Emmons and also by Prof. M. Tuomey.

Teeth elongated conical, pointed, nearly straight, or more or less moderately curved inwardly, with opposed carinæ on the inner side, which are entire or denticulated; transverse section subcircular, flattened internally; surfaces even, or more or less distinctly fluted on the outer side or all around, and covered with minute interrupted ridges, which are vertical on the even surface, oblique on the fluted surface, and divergent downward in the vicinity of the carinæ. Crown solid, enamel thin, dentine concentric; fang subcylindrical, hollowed at base. Length from 5 lines to $1\frac{1}{2}$ inches, breadth from 2 lines to $4\frac{1}{2}$ lines.

Bodies of the vertebræ bi-concave and much constricted, as in *Palæosaurus?* and *Clepsysaurus*. Length of one of the posterior cervical bodies 16 lines, depth of its articular surfaces 17 lines, width 15 lines.

Dermal plate covered with radiating, bifurcating and anastomosing ridges.

Allied to *Clepsysaurus* and *Centemodon*, Lea, and probably identical with them.

LABYRINTHODONTA.

6. *DICTYOCEPHALUS ELEGANS*, Leidy.

Founded on the upper portion of a cranium discovered by Prof. Emmons in the coal-field of Chatham Co., N. C. Plates of the cranium covered with reticular ridges in a general radiant manner. Parietals comparatively short, broader in front than behind; parietal foramen near the centre of the bones. Occipitals quadrate, a little longer than broad. Posterior outline of the cranium with a superficial transverse concavity on each side and not a deep sinus as in *Trematosaurus* and *Archegosaurus*. Breadth of occipital outline 28 lines; length of parietals $8\frac{1}{2}$ lines, breadth anteriorly $3\frac{1}{2}$ lines, posteriorly 3 lines. Probable length of head, considering it to have had nearly the proportions of *Trematosaurus*, 4 inches, breadth $2\frac{1}{2}$ inches.

PISCES.

7. *ISCHYRHIZA ANTIQUA*, Leidy.

The genus was originally based on a tooth found in the Green Sand of New Jersey. Two teeth apparently of a second species have been obtained by Prof. Emmons on the Neuse River, N. C.

Crown of the teeth, when perfect, apparently, laterally compressed conical. Fang robust, quadrately pyramidal, curved; with a rugged base which is bifurcated antero-posteriorly and more deeply before than behind. Pulp cavity entirely closed at bottom. Probable length of specimens when entire $1\frac{1}{2}$ and 2 inches; length of fang 10 lines, and 1 inch; breadth of crown at base antero-posteriorly 5 lines, 6 lines; laterally $3\frac{1}{2}$ l., $4\frac{1}{2}$ l.; breadth of fang at bottom antero-posteriorly 7 l., $8\frac{1}{2}$ l.; laterally $6\frac{1}{2}$ l., 7 l.

Notice of some Remains of Fishes discovered by Dr. John E. Evans.

By JOSEPH LEIDY, M. D.

1. *CLUPEA HUMILIS*, Leidy.

Founded on an impression of the fish upon one half of a clay stone nodule from a tertiary deposit of Green River, Missouri.

Length $3\frac{1}{2}$ inches; greatest depth 16 lines. Dorsal fin with 15 rays; abdominal 7, anal 14; caudal 20? From the head to the position of the anus 28 abdominal spines may be counted.

2. *CLADOCTYLUS? OCCIDENTALIS*, Leidy.

Based on specimens of isolated scales, attached to masses of an ash-colored chalk, from the cretaceous deposits of the upper Missouri.

- The scales are almost the size of, and bear considerable resemblance to, those of *Cutostomus bubalus*. A nearly circular scale is about $1\frac{1}{2}$ inches in diameter, and an ovoidal scale has been nearly 3 inches wide and 1 inch long. Deep radiant grooves mark the uncovered portion, and minute granule-like points the opposed portion, while the intermediate tracts are smooth.

3. *EXCHODUS SHUMARDI*, Leidy.

Based on the specimen of a right dental bone found in company with *Cladocycclus occidentalis*. The bone has been about an inch in length, and in the specimen it supports a series of six large teeth, of which the first one is 3 lines long and the last one $\frac{1}{2}$ of a line. The border of the bone outside of the long teeth is fringed with minute teeth.

The species is named in compliment to Dr. Benj. F. Shumard, of St. Louis, who assisted Dr. Evans in his important explorations.

The Secretary announced the death of Mr. Samuel B. Ashmead, late a member of the Academy.

ELECTION.

Drs. Ellwood Wilson and Robert E. Griffith, of Philadelphia, and Dr. Eugene Francfort, of Middletown, Conn., were elected members of the Academy.

November 4th, 1856.

MR. LEA, Vice-President, in the Chair.

Letters were read—

From the Imperial Academy of Science and Belles Lettres of Lyons, dated July 14th, 1856, transmitting its Memoires.

From the Linnean Society of Lyons, dated July 9th, 1856, of the same tenor.

From the Imperial Society of Agriculture, Natural History, and the Useful Arts, of Lyons, dated July 8th, 1856, of the same tenor.

A paper was read, entitled "Description of a new Species of Tanager of the genus *Saltator*, by Philip Lutley Solater." Referred to a committee consisting of Dr. T. B. Wilson, Mr. Cassin, and Dr. Hallowell.

Mr. Lea presented a paper entitled "Descriptions of Eleven new species of *Uniones* from Georgia, by Isaac Lea." Referred to a committee, consisting of Dr. T. B. Wilson, Mr. Binney, and Dr. Leidy.

Mr. Lea read portions of a letter from Dr. J. Lewis, dated Mohawk, N. Y., October 28th, 1856, giving a list of living mollusca in "Little Lakes," Otsego County, N. Y. Referred to the Committee on Proceedings.

"The geological character of the basin in which the upper or northern Lake lies, is sufficiently explained by the out-cropping rocks of "Coriferous limestone" that appear near its eastern and western shores. The bottom of the lake was formerly, no doubt, either a stratum of the "Coriferous", or the "Onondaga Limestone" of the New York Geological surveys.

The lake is fed by a few small streams that drain a considerable extent of territory of the same geological character, and it is fair to presume that a considerable quantity of lime enters the lake in solution, where, by the influences of light, heat, evaporation, and animal and vegetable life, most of the lime is deposited in the form of a greenish grey mud, in which are immense numbers of shells, which are perhaps the accumulation of ages, and form in the lake and the surrounding marshes beds of marl, in many places over 20 feet deep. In such a locality the mollusca might be expected to exhibit some unusual or singular features, and such indeed is the case.

The species that have fallen under my observation have been sought only in the upper lake. The lower lake (which does not exhibit the marl of the upper to any remarkable extent) is so variable in its depth, from being raised or lowered to meet the requirements of a mill on its outlet, that a favorable opportunity for examining it has not occurred at such times as could be made available. The species do not differ, so far as known, from those of the upper lake.

Unio radiatus (var ?) Lam.

Anodonta ——— ? between *fragilis* and *fluviatilis*.

Cyclas similis, Say. In shallow water.

Cyclas rhomboides, Say. Borders of marshes.

Cyclas crocea, Say. Borders of marshes.

Pisidium variabile. Prime.

Pisidium compressum. Prime.

Pisidium ventricosum. Prime, (obtusale ? Pff.)

Lymanea gracilis, Jay. Dead shells only seen in fragments.

Lymanea columella, Say. On aquatic plants.

Lymanea appressa, Say. One dead shell seen only.

- Lymnaea* ———. Small and white; rarely seen except in marl.
Lymnaea desidiosa, Say. Shores.
Lymnaea humilis, Say. Shores.
Planorbis trivolvis, var. *corpulentus*, Say. Rarely seen.
Planorbis campanulatus, Say.
Planorbis bicarinatus, Say. Small and white.
Planorbis hirsutus, Say. Borders of marshes.
Planorbis deflectus, Say. Borders of marshes.
Planorbis parvus, Say. Borders of marshes.
Physa heterostrophæ, Say.
Ancylus, two species. On rushes.
Paludina decisa? Say. Shell coated with a fine red pigment, very adherent; animal of a lighter color than any variety of *decisa* I have seen.
Amnicola limosa, Say.
Am. (Pal.) pallida? Lea. (Small, acutely conic;) rare.
Valvata tricarinata, Say.
Valvata, var. *bicarinata*, Lea. Runs into every change of carination that can be supposed. Sometimes one, sometimes two of the carinæ are absent.
Valvata sincera, Say. Animal blue, seen through the shell, which is white and translucent, while the shells of *tricarinata*, *bicarinata* and varieties are of usual characteristic green. Shells smooth, polished.
Valvata striata, Lewis. Undescribed. Shell conical, depressed, umbilicate, aperture round; epidermis brown and very regularly striata. Has all the other features of *sincera*, except color and translucency. Animals not observed. Very rarely seen. Of several hundred living specimens of *Valvata*, only seven were of this species. These are all the aquatic species yet observed."

Mr. Lea also read a letter from Thomas Biddle, Jr., Esq., U. S. Consul at Singapore, dated August 21st, 1856, enclosing one from Prof. Oldham of Calcutta, offering to exchange the publications of the Asiatic Society, and of the Geological Society of British India, for those of the Academy. Referred to the Publication Committee with power to act.

November 11th.

MR. LEA, Vice-President, in the Chair.

A paper was presented for publication in the Proceedings, entitled "Characters of an undescribed Bird, belonging to the genus *Campylorhynchus* of Spix, with remarks upon other species of the same group. By Philip Lutley Selater, M. A." Referred to a committee consisting of Dr. Wilson, Mr. Cassin and Col. McCall.

Mr. Cassin presented for publication in the Proceedings, a paper entitled "Birds of Southern Indiana, by Rufus Haymond." Referred to Mr. Cassin, Dr. Wilson and Col. McCall.

Dr. Leidy presented a paper for publication in the Proceedings, entitled "Notice of remains of two species of Seal, by Joseph Leidy, M. D." Referred to a Committee consisting of Dr. Bridges, Mr. Vaux, and Dr. Hallowell.

Dr. Leidy presented a paper for publication in the Proceedings, entitled "Descriptions of new Fossil Species of Mollusca, collected by Dr. F. V. Hayden, in Nebraska Territory, under the direction of Lieut. G. K. Warren, of the U. S. Topographical Engineers, with a catalogue of all the remains hitherto described and identified from the Tertiary and

cretaceous rocks of that region. By F. B. Meek and F. V. Hayden, M. D." Referred to a committee consisting of Dr. Leidy, Mr. Lea and Dr. Bridges.

Dr. Carson exhibited a specimen of cochineal received by him from Prof. Henry, and accompanied by a letter from Capt. A. W. Bowman, U. S. A., dated Fort Stanton, New Mexico, September 18th, 1856, stating that the specimen was collected on Sept. 9th, in about lat. 34° from the most common variety of Cactus, known as "prickly pear," Dr. C. remarked that the specimen was interesting in consequence of exhibiting the webby matter thrown out by the insect at a certain period of its growth.

Dr. Uhler called attention to a second specimen of red and black catfish, similar to and obtained from the same locality as the one presented by him some weeks ago.

November 18th.

MR. LEA, Vice-President, in the Chair.

Dr. Hallowell presented a paper entitled, "On a new and remarkable genus of Ranidae, from the river Parana, by Edward Hallowell, M. D." Referred to a committee consisting of Maj. Le Conte, and Drs. Leidy and Uhler.

Dr. Rand announced the death, on the 16th inst., of Edmund Lang, M. D., late a member of this Academy.

November 25th.

DR. BRIDGES, Vice President, in the Chair.

The Committees to which were referred Messrs. Solater's and Lea's papers read 4th inst.; Messrs. Solater's Haymond's, Leidy's, Meek and Hayden's papers read 11th inst.; and Dr. Hallowell's paper read 18th inst.; severally reported in favor of publication in the Proceedings.

Description of a new species of Tanager of the genus SALTATOR.

By PHILIP LUTLEY SOLATER.

SALTATOR ATRIPENNIS.

Supra olivaceo-viridis; capite alis et caudâ nigris; vitta superciliari longâ et maculâ auriculari utrinque albis; subtus pallide cinerascens-albus, gulâ albâ, crisso ochraceo; rostro nigro; pedibus nigro-fuscis. Long. tota 7.4, alæ 4.2, caudæ 3.6 poll. angl.

Hab. in Novâ Grenada, Popayan.

Mus. Acad. Nat. Sc. Philadæ.

Two specimens of this very distinct species of *Saltator* are in the Academy's collection, one marked "Popayan," the other "New Grenada." There is no known bird of the genus to which it shows great resemblance, but I think it may be most naturally arranged near to *S. ornocensis*.

Description of eleven New Species of Exotic UNIONES, from Georgia.

By ISAAC LEA.

UNIO ELLIOTTII. Testâ grandè plicatâ, subquadratâ, inflatâ, valdè inæquilaterali; valvulis percrassis; natibus prominentibus, tumidis; epidermide nigrâ, nitidâ; dentibus cardinalibus permagnis, duplicis; lateralibus crassis, longis, lamellatis subcurvisque; margaritâ argenteâ et iridescente.

Hab. Othcalooga Creek, Gordon Co., Georgia. Bishop Elliott.

UNIO GRACILIOR. Testâ lævi, ellipticâ, inflatâ, inæquilaterali; valvulis tenuibus; natibus prominulis; epidermide tenebroso-fuscâ, obsoletè radiatâ et nitidâ; dentibus cardinalibus compressis erectisque; lateralibus lamellatis, longis subcurvisque; margaritâ albidâ et valdè iridescente.

Hab. Buckhead Creek, Burke Co., Georgia. Bishop Elliott.

UNIO PULLATIS. Testâ lævi, transversâ, inflatâ, valdè inæquilaterali; valvulis crassis; natibus prominulis; epidermide tenebroso-nigrâ; dentibus cardinalibus curtis, crassis, duplicis; lateralibus crassis, longis subrectisque; margaritâ vel purpureâ vel salmonis colore tinctâ et iridescente.

Hab. Creeks near Columbus, Georgia. Bishop Elliott.

UNIO FAVOSUS. Testâ lævi, subtriangulari, subcompressâ, inæquilaterali; posticè subangulatâ; valvulis subcrassis; natibus prominulis, ad apices undulatis; epidermide luteo-olivaceâ, virido-maculatâ; dentibus cardinalibus magnis, erectisque; lateralibus crassis, sublongis subrectisque; margaritâ argenteâ et valdè iridescente.

Hab. Othcalooga Creek, Gordon Co., Geo. Bishop Elliott.

UNIO RUTILANS. Testâ lævi, ellipticâ, inflatâ, valdè inæquilaterali, in medio ad basim paulisper compressâ; valvulis tenuibus; natibus prominulis; epidermide luteo-viridi et valdè radiatâ; dentibus cardinalibus parvis, compressis, duplicis; lateralibus prælongis, lamellatis subcurvisque; margaritâ cæruleo-albâ et valdè iridescente.

Hab. Othcalooga Creek, Gordon Co., Georgia. Bishop Elliott.

UNIO ERRANS. Testâ lævi, oblongâ, compressâ; valdè inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscâ, obsoletè radiatâ; dentibus cardinalibus parvis, compressis; lateralibus prælongis, lamellatis subrectisque; margaritâ vel purpureâ vel salmonis colore tinctâ et iridescente.

Hab. Tobesaufkie Creek, near Macon, Georgia. Bishop Elliott.

UNIO VICINUS. Testâ lævi, oblongâ, compressâ, inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide virido-fuscâ, obsoletè radiatâ; dentibus cardinalibus parvis, acuminatis compressisque; lateralibus longis subcurvisque; margaritâ argenteâ et valdè iridescente.

Hab. Swift Creek, near Macon, Georgia. Bishop Elliott.

UNIO SUBELLIPSA. Testâ lævi, ellipticâ, inflatâ, inæquilaterali, ad basim rotundâ; valvulis crassis; natibus subprominentibus; epidermide tenebroso-brunneâ, politâ, radiatâ; dentibus cardinalibus brevibus, tumidis, subelevatisque; lateralibus prælongis subrectisque; margaritâ argenteâ et iridescente.

Hab. Creeks near Columbus, Georgia. Bishop Elliott.

UNIO GEMINUS. Testâ lævi, ellipticâ, inflatâ, inæquilaterali; valvulis crassis; natibus prominulis; epidermide tenebroso-castaneâ, obsoletè radiatâ, ad umbones politâ; dentibus cardinalibus magnis, acuminatis, duplicis; lateralibus longis, crassis subcurvisque; margaritâ purpureâ et iridescente.

Hab. Buckhead Creek, Burke Co., Georgia. Bishop Elliott.

UNIO ROSTRIFORMIS. Testâ lævi, valdè transversâ, compressâ, at latere planulatâ, valdè inæquilaterali, posticè acutè acuminatâ; valvulis tenuibus; natibus vix prominulis, ad apices undulatis; epidermide tenebroso-fuscâ, obsoletè ra-

diatâ, dentibus cardinalibus parvis, acuminatis, duplicis; lateralibus prælongis, lamellatis rectisque; margaritâ subpurpureâ et iridescente.

Hab. Swift Creek, near Macon, Geo. Bishop Elliott.

UXIO BLANDIANUS. Testâ tuberculatâ, quadratâ, inflatâ, subinæquilaterali, posticâ truncatâ et emarginatâ, ad basim emarginatâ, in medio sulcatâ; valvulis percrassis; natibus prominentibus, incurvis, ad apices rugoso-undulatis; epidermide tenebroso-castaneâ; dentibus cardinalibus crassissimis, crenulatis, duplicis; lateralibus brevibus, percrassis rectisque; margaritâ argenteâ et iridescente.

Hab. Othcalooga Creek, Gordon Co., Geo. Bishop Elliott.

Characters of an apparently undescribed bird belonging to the genus CAMPYLORHYNCHUS, of Spix, with remarks upon other species of the same group.

By PHILIP LUTLEY SCLATER, M. A.

CAMPYLORHYNCHUS HUMILIS.

Suprà rufescenti-griseus albo et nigro mixtus; dorsi et scapularum pennis medialiter albis indè nigris hoc colore rufescenti-griseo undique limbatis: nuchâ cum cervice posticâ et linâ postoculari rufis; capitis antici pennis nigris rufo terminatis: alis caudâque nigris suprà albido regulariter transfasciatis, subtus autem ferè unicoloribus, rectricibus omnibus albo latè terminatis: linâ latâ et elongatâ superciliari et corpore subtus lactescenti-albis; crisso nigro regulariter transfasciato: striâ parvâ gutturali utrinque nigrâ: rostro plumbeo: pedibus brunneis: long. totâ 5.5, alæ 2.5, caudæ 2.2, rostri a rictu .75 poll. angl.

Hab. in Mexico Boreali propè Mazatlan (Bell).

This bird nearly resembles the *Campylorhynchus capistratus*, of Southern Mexico and Central America, figured by Des Murs in his *Iconographia Ornithologica* (pl. 63), but may be at once distinguished by its diminutive size and the rufous head and post-ocular stripe, these parts being black in the other species. There are three specimens of it in the Academy's collection. One of these was obtained by Mr. Bell, near Mazatlan, a second is marked "*California, Dr. Gambel's collection*," and the third is one of the birds procured during the voyage of the *Venus*, but has no locality affixed. The Academy's collection, likewise, contains six examples, which I consider referable to *Camp. capistratus*. Four of these present the usual normal appearance of that bird, but the remaining two are considerably inferior in size, and but slightly exceed the present species in dimensions. One of these latter birds is also much spotted and blotched on the lower surface, and seems to be in that state of plumage in which it was characterized by Lesson as *Picolaptes rufinucha*. But as the black head is persistent in all these examples, even in such as are in manifestly immature plumage, I am induced to believe that the present bird with its rufous head and size, still more diminutive than in the smallest examples of *C. capistratus*, is really to be regarded as a distinct species.

I think it is very probable that this is the *Campylorhynchus* described, but not named, by Prince Bonaparte, in his *Notes upon Delattre's collections*, (p. 43.)

The genus *Campylorhynchus* was established by Spix in the first volume of his *Birds of Brazil*. In the *Magasin de Zoologie* in 1835, M. de Lafresnaye, proposed to use Lesson's term *Picolaptes*, for the same group. This is not proper, as M. de Lafresnaye has himself subsequently acknowledged, because, in the first place, Spix's name has the priority; and secondly, Lesson's term was applied by him originally to a particular genus belonging to the different subfamily (*Dendrocolaptinae*) for which it should be retained, although the same author subsequently described several typical members of the group as being *Picolaptes*. Many species of this genus present very great similarity in plumage, and from this fact and from their being considerable variation in the size and coloring of individuals, in some of the species, there is often much difficulty in determining them satisfactorily.

As to the true position of the group, I quite agree with M. de Lafresnaye, who first described the greater part of the species, that its natural place is among the true wrens near the the genus *Thryothorus*, though pointing through the closely-allied forms *Heleodytes* and *Donacobius*, towards the mocking-birds (*Mimus*.)

The following is a list of the species of *Campylorhynchus*, which I consider to rest on good authority:

1. *C. scolopaceus*, Spix, Av. Bras. i. pl. 79, fig. 1. (*Opetiorhynchus turdinus*, P. Max.) from Brazil: one specimen in the Academy's collection. The synonyms of this bird in Prince Bonaparte's *Conspectus*, have been somehow mixed up with those of the last species of the genus next preceding it. Spix has figured it with tolerable accuracy. *Turdus variegatus*, of Gmelin, is, sometimes considered to be identical with this species.
2. *C. hypostictus*, Gould, P. Z. S., 1855, p. 68, from Eastern Peru. An ally of the preceding, but having the body below much more thickly covered with spots. The only specimens I have seen of it were those received by Mr. Gould, which were obtained by Hawksell, on the Ucayali.
3. *C. unicolor*, Lafr., R. Z., 1846, p. 53. (*Picolaptes scolopaceus*, Lafr. & D'Oorb., Syn. Av. in Mag. de Zool., 1837, p. 46. *Anumbius scolopaceus*, D'Orb. Voy., p. 256), from Bolivia. Two specimens of this bird are in the Academy's collection. They may be distinguished from *C. scolopaceus*, to which they are most closely related, by their nearly uniform white under-surface.
4. *C. unicoloroides* (!) Lafr., R. Z., 1846, p. 316, from Bolivia. I am not acquainted with this species. It would seem, from its curious name, to be closely allied to the last.
5. *C. zonatus*, (Less. Cent. Zool., t. 70.) A Mexican species not uncommon in collections. The Academy possesses three examples, one of which, was obtained by Mr. Pease, in the province of Vera Cruz.
6. *C. zonatoides* (!) Lafr., R. Z., 1846, p. 92, from New Grenada. I have not yet seen this bird in very perfect plumage. There is one specimen in the Academy's collection probably referable to this species.
7. *C. megalopterus*, Lafr., (Des Murs, Icon. Orn., p. 54.) A large species, recognized by its being wholly spotted and barred with black and white. There are examples in the Academy's collection, probably from Mexico.
8. *C. pallescens*, Lafr., R. Z., 1846, p. 93. One specimen in the Academy's collection, which I take to belong to this species, seems to be closely allied to the preceding, but distinguished by its nearly uniform head, more obsoletely spotted under-surface, and differently marked tail. It is labelled "*Guyaquil*."
9. *C. nuchalis*, Cab. Orn. Notiz. in Weigm. Archiv. I., p. 206.—This bird is very like *C. megalopterus*, but much smaller in size, and with the head and nape unstriped. There are examples in the Academy's collection from Venezuela, and I have often seen it from Trinidad.
10. *C. brevirostris*, Lafr., R. Z., 1845, p. 339, from Bogota. I have not met with this species.
11. *C. brunneicapillus*, (*Picolaptes brunneicapillus*, Lafr., et Cass. B. Cal. pl. 25, p. 156), from Texas and Northern Mexico. There are specimens of this bird and of its eggs in the Academy's collection. The latter are rather peculiar in coloring, and somewhat resemble those of the European Redbreast—(*Erythacus rubecula*.)
13. *C. capistratus*, (*Picolaptes capistratus*, Less. R. Z., 1842, p. 174: *Picolaptes rufinucha*, Lafr. R. Z., 1845, p. 339, et Less. Descr. d. Mamm. & Ois., p. 285), from Southern Mexico and Central America.
13. *C. humilis*.

Besides these species, *Thryothorus guttatus*, Gould, P. Z. S., 1836, p. 39, and *Piscolaptes cinnamomeus*, Less. R. Z., 1844, p. 433, are sometimes considered as probably referable to species of this group.

A very closely allied form is *Halodictes*, of Cabanis. I have made remarks on the synonyms of the type of this genus (*H. griseus*), in Proceedings Zool. Society, 1856, p. 97.

Notice of remains of two species of Seals.

By JOSEPH LEIDY, M. D.

1. *PHOCA WYMANI*.

Remains of a Seal. Wyman, Am. Jour. Sci. x. 229.

Phoca Wymani, Leidy. Anc. Fauna of Nebraska, 8.

A tooth, apparently an inferior canine, from the miocene deposits of Virginia, recently presented to the Academy by Prof. Tuomey, I suspect to belong to the same species as the remains of a seal from the same deposits, described by Prof. Wyman.

The tooth is 14 lines long, and about as robust in its proportions as the corresponding tooth of *P. barbata*. The crown is $4\frac{1}{2}$ lines long and $3\frac{1}{2}$ broad at base; and it presents an anterior and a posterior ridge, of which the former is denticulated, and bifurcates half way towards the base. The enamel is rugose, especially towards the base of the crown internally; and at one or two points in front and behind it presents a short inconspicuous tubercle.

2. *PHOCA DEBILIS* Leidy.

A species of seal is apparently indicated by three specimens of molar teeth obtained by Capt. Bowman, U. S. A., from the sands of Ashley River, South Carolina. The teeth bear considerable resemblance to the corresponding ones of *Otaria jubata*, having small, compressed conical crowns, tuberculate in front and behind, and single, long, gibbous fangs. The smallest specimen is $5\frac{1}{2}$ lines long, and the largest, when perfect, was about an inch long.

Descriptions of new fossil species of MOLLUSCA collected by Dr. F. V. Hayden, in Nebraska Territory; together with a complete Catalogue of all the remains of Invertebrata hitherto described and identified from the Cretaceous and Tertiary Formations of that region.

By F. B. MEKE and F. V. HAYDEN, M. D.

Since the publication of our former papers on the Nebraska fossils, some additional collections have come to hand, containing new species, which we here propose to describe. Along with these we also find better specimens of some of the species previously investigated by us, than those first received, so that we are now able to correct a few errors into which we had been led, in consequence of having only imperfect specimens to examine. The extensive material at our command, also enables us to rectify some little confusion in the labors of others, which doubtless resulted from the same cause. In order to do this, as well as to furnish a convenient index to these Nebraska species, we append to this paper a complete list of all the fossil invertebrata now known from the rocks of that country.

In glancing over this catalogue, the palaeontologist will not fail to be struck with the great preponderance of *Lamellibranchiata*, *Gastropoda*, and *Cephalopoda* over all the other invertebrate forms of life. Among all the collections we have yet seen from this region, the *Bryozoa* are represented by but one rare species of *Reticulipora*, and the *Brachiopoda* by only one species of *Caprimella* and one of *Lingula*, both so rare that but a single specimen of each has been found; while of the whole great class of *Echinodermata*, which existed in such vast numbers, and presented such an infinite variety of beautiful forms, during these epochs in

some parts of the world, we have yet only seen from this region, a single fragment, too imperfect to give any clue to its generic relations. The paucity of some, and entire absence of others, of the more common genera of *Mollusca*, such as *Ostrea*, *Gryphaea*, *Exogyra*, &c., in these collections is worthy of notice. Future investigations, it is true, may add more species to our present meager list of these rare forms, yet it is probable we have here something like an expression of the numerical proportions in which many of the lower types of life existed in these ancient seas.

Of the one hundred and ninety-one species enumerated in this catalogue, forty-four belong to the Tertiary system, and one hundred and forty-seven to the Cretaceous. None of the former are known to occur in the States, or on the other side of the Atlantic, while of the Cretaceous species, nine appear to be common to the Nebraska formations and those of the States, and four are identical with forms occurring in the old world.* Of these nine species having so great a geographical range, six, or nearly one-third of all that class of *Mollusca* contained in the list, belong to the *Cephalopoda*, while nearly all the remaining one hundred and seventy-six species, which appear to be restricted to the north west, belong to the *Lamellibranchiata* and *Gasteropoda*. This, however, is not so surprising when we bear in mind the fact that the habits and organization of these ancient *Mollusca* must have been such, from what we know of their existing analogues in our present seas, that the former depended on accident, or feeble locomotive organs, for their gradual distribution over the world from their various centers of creation, while the *Cephalopoda*, owing to their superior locomotive powers, were capable of wandering freely far out over the most profound parts of the ocean.

In order to convey a clear idea of the relative positions and vertical range of the fossils enumerated in this catalogue, as well as of the nature and order of succession of the various strata from which they were obtained, we give at the end of these remarks, a more complete section of the Nebraska formations than has been yet published. Future investigations may, it is true, show a more intimate relation between the sub-divisions represented in this section than we are aware of at this time, yet so far as we now know, each one of them appears to have been formed during the prevalence of physical conditions so widely different from those in existence at the time of the deposition of each of the others, that not a single species of the fossils found in them seems to be common to any two, excepting No. 4 and 5, and perhaps No. 2 and 3. We think, however, when more is known in regard to the range of species in these rocks, it may be found convenient to group them together as follows:—

- Group A. Miocene.
- “ B. Eocene.
- “ C. No. 4 and 5 of the section.
- “ D. No. 2 and 3 “ “
- “ E. No. 1 “ “

At any rate, by such a classification, we would have divisions which, so far as our present knowledge extends, appear to be characterized, not merely by distinct species, but by rather different types of fossils.

In one of our former papers, we mentioned the fact that some of the forms in division No. 4 resemble those of the upper Green Sand of English geologists. Although this is the case, later collections appear to show that many species we had supposed restricted to the upper of these two rocks, also occur in the lower. In addition to this, we have more recently ascertained that *Pleurotoma minor* (Evans and Shumard's unpublished MSS.,) as well as a species of *Fasciolaria*†

* It is quite probable a few other species may yet be found in Nebraska that will prove to be common to the Cretaceous rocks of that region and those of the States, as well as with those of the old world. We look for them chiefly amongst the *Cephalopoda*.

† These genera are generally regarded as having been introduced towards the close of the Cretaceous epoch.

perhaps identical with our *F. buccinoides*, both of which were at first only met with in the bed of No. 5, likewise occur in No. 4. From these facts, we are inclined to regard these two rocks as only well marked subordinate members of the same natural group, which is of the age of the true chalk.

Too few fossils have yet been found in No. 2 and No. 3 to settle very definitely their position in the Cretaceous system, though the late discovery by one of us* of *Inoceramus problematicus*, near the base of the first, appears to show that this bed is not, at any rate, older than the upper Green Sand, and that it may also belong to the chalk.

In our section of the Nebraska formations, given in a paper published in the 8th vol. of the Proceedings of the Academy, page 63, it will be remembered we placed provisionally the beds of sandstone and clay composing formation No. 1, seen at the mouth of Big Sioux river and below there, along with the Cretaceous strata, stating at the same time that they were not positively known to belong to that system. We still think it barely possible these beds may be older than Cretaceous, though if represented, as we think they are, by similar beds seen holding about the same position near the mouth of Judith river, far up towards the sources of the Missouri, we must either refer them to the Cretaceous system, or admit the introduction of the genus *Baculites* before that epoch, as we have fragments of a small species of that genus from the Judith river beds. At the same time it should be borne in mind that these strata at the last named locality are characterized by a group of fossils remarkably distinct from those in the rocks above, and that one species belongs to the genus *Hettangia*, a type of bivalves, not known to occur, in the old world, in more modern formations than those of the age of the Lias. If not older than Cretaceous, we think, from these facts, as well as from the stratigraphical position of these beds, they probably represent some of the older members of that system. What relation they bear to the formations near the same locality, in which the saurian remains were found, supposed by Prof. Leidy to be allied to the genera *Iguanodon* and *Megalosaurus*, is still an unsettled question.

Should these Big Sioux and Judith river formations prove to be Jurassic, or even to represent both the Jurassic and Triassic systems, it would not conflict with the statement made by us in our last paper, that Mr. Marcou was mistaken in coloring as Triassic and Jurassic the immense extent of country referred to by us between these two localities, as we know this great area to be wholly occupied by well marked Cretaceous and Tertiary strata, while the above named doubtful beds, no where come to the surface near the Missouri, between these two widely separated localities, excepting for a short distance below the mouth of Judith river.

It would, perhaps, be premature to attempt, at the present time, the task of tracing out in much detail the parallelism of the various members of the Cretaceous system in Nebraska, with those of New Jersey and other well known districts in the States, or with those of the south western Territories; yet the occurrence of several of the more common and characteristic fossils of the upper two Nebraska formations, such as *Ammonites placenta*, *Scaphites Conradi*, *Baculites oratus*, *Nautilus Dekayi*, &c., in the first and second Green Sand beds and intervening ferruginous stratum of New Jersey,† as well as in the "Rotten Limestone" of Alabama, clearly indicates the synchronism of these deposits, notwithstanding their widely separated geographical positions.

At the same time the total absence of the above named fossils, and indeed so far as we yet know, of all the other species of the lowest and upper two Nebraska Cretaceous formations, in the rocks from which Roemer and others collected so many species in Texas, and other south western localities, renders it highly probable that if the latter occur at all in Nebraska they must be represented by

* Dr. Hayden.

† For our knowledge of the geological positions of these fossils in New Jersey, we are indebted to Prof. Geo. H. Cook, of the geological survey of that State.

the beds No. 2 and 3 of our section. This conclusion is further strengthened by the fact that the only Nebraska species yet found in the south west, so far as we know, are *Inoceramus problematicus* and *Ostrea congesta*, both of which are unknown in the north west excepting in the above named beds, and are mainly restricted to the latter. The well marked specific characters of these two fossils, and their limited vertical range, together with their extensive geographical distribution, render the bed in which they occur a horizon of the highest importance in the identification of strata at remotely separated localities in these far western territories.

That these beds, or formations of the same age, are widely distributed over a vast area of country, extending from near the great bend of the Missouri in lat. $44^{\circ} 15'$, long. $99^{\circ} 20'$, westward to, and perhaps beyond, the eastern slope of the Rocky mountains, and far south into Texas and New Mexico, is highly probable, from the occurrence of their characteristic fossils at many widely separated localities in this region. At any rate, we know, from information obtained through Mr. Henry Pratten, of the Geological Survey of Illinois, that *Inoceramus problematicus* is found in a light colored limestone overlying a red sand stone on Little Blue river, a tributary of Kansas River. Col. Fremont also collected specimens of the same shell from a similar rock on Smoky Hill river, in lat. 39° , long. 98° , and at other localities between there and the Rocky mountains.* More recently, Lieut. Abert found the same, or a closely allied species, at a point as far south west as lat. $35^{\circ} 13' N.$, long. $107^{\circ} 2' W.$, and apparently on the western declivity of the anticlinal axis of the Rocky mountains.† Roemer likewise collected in Texas specimens of a shell he refers to *Inoceramus mytiloides* of Mantell, which is considered identical with *I. problematicus* of Schlotheim. In addition to this, we have seen, in Mr. Marcou's collection, specimens of *Ostrea congesta*, from Galisteo, between Fort Smith and Santa Fe, where it probably holds the same geological position as the so-called *Gryphæa dilatata*.

The formations from which the above named fossils were obtained in the south western Territories, appear, from the statements of the various explorers of that region, to repose on a series of red, yellow, and whitish sandstones and various colored clays, which are referred by Mr. Marcou to the Jurassic and Triassic systems. These lower beds we think are represented wholly, or in part in Nebraska, by our formation No. 1, which, as previously stated, we regard as probably belonging to the lower part of the Cretaceous system, though it may be older.

In the remarks accompanying our paper on the fossils of the Lignite Tertiary formations of Nebraska, although satisfied they must be middle or lower Tertiary types, we refrained from the expression of any opinion as to the exact age of the beds in which they were found; not having been able to identify positively any of the species with characteristic forms of either of these members of the Tertiary system in other countries. Being all specifically distinct from previously known forms, and belonging nearly exclusively to land and fresh water genera, we could of course base no conclusions on comparisons with the fossils of the Tertiary formations hitherto most successfully investigated on other parts of this continent, since the latter deposits are almost wholly characterized by marine genera. So far as we had been able to compare them with figures and descriptions of foreign species, the evidence appeared contradictory, some of them being like Miocene and others like Eocene types. As we now have, however, the additional weight of evidence derived from Dr. Newberry's investigations of the fossil flora of these formations, in favor of the conclusion that they are of Miocene age, we can no longer hesitate in referring them to that epoch. Dr. Newberry's opinion on this point is worthy of the highest confidence, since, in addition to an extensive and accurate general knowledge of fossil botany, he has had the advantage of being able to make direct comparisons of these plants with the flora of well determined Miocene deposits in California.

* See Prof. Hall's figures and remarks in Fremont's report, p. 174, pl. 4.

† Lieut. Abert's report of explorations in New Mexico and California, p. 547.

Vertical Section of the Geological formations of Nebraska Territory, so far as determined.

		SUBDIVISIONS.	LOCALITIES.	Estimated thickness.
TERTIARY SYSTEM.	MISSOURI.	Beds of clay, sandstone and lignite, containing numerous remains of plants, and land and fresh water, with a few marine or estuary molluscs.	Great extent of country on both sides of the Missouri between Heart and Milk rivers.	300 to 400 feet.
	BOCHEL.	Light colored indurated clays, with occasional beds of sandstone, conglomerate, and white limestone, the latter in thin layers. Numerous remains of <i>Mammalia</i> and <i>Chelonis</i> , with a few land and fresh water molluscs.	[Mauraines Torres of White River.	250 to 300 feet.
CRETACEOUS SYSTEM.	No. 5.	Gray and yellowish arenaceous clays, sometimes weathering to a pink color. Great numbers of marine molluscs, with a few land plants, bones of <i>Megacerurus</i> , &c.	Moreau Trading Post and under the Tertiary at Bear and Sage Creeks. Fox hills.	100 to 150 feet.
	No. 4.	Bluish and dark gray plastic clay, containing numerous marine molluscs.	Great area about Fort Pierre and along the Missouri below. Under No. 5, at Sage and Bear Creeks. Great Bend of the Missouri. Near Milk and Muscle shell rivers.	350 feet.
	No. 3.	Lead gray calcareous marl, weathering to light yellowish tint. Scales of <i>Sabes</i> — <i>Ostrea congesta</i> , <i>Meccurus problematicus</i> , &c.	Bluffs along the Missouri below Great Bend.	100 to 125 feet.
	No. 2.	Dark gray laminated clay. Scales of <i>Sabes</i> , with a few small <i>Ammonites</i> , &c.	Along Missouri Bluffs, below mouth of James River.	50 feet.
	No. 1.	Heavy bedded yellowish sandstone, passing downwards into alternations of sandstone and clay, containing bits of water-worn lignite and bands of dark carbonaceous matter. This formation is not positively known to belong to the Cretaceous System.	Near the mouth of Big Sioux River, and between there and Council Bluffs. Near Judith River?	50 to 100 feet. See also p. 18.
CARBONIFEROUS SYSTEM. UPPER.		Yellow limestone, containing <i>Paralasma ophioides</i> , <i>Trochotula subtilis</i> , <i>Spirifer Montebellianus</i> , <i>Alportina regularis</i> and other fossils of the Coal measures.	Forms shoals in the Missouri near Black Bird Hills. Eight or ten feet above low water mark at Council Bluffs.	Unknown.

*Descriptions of Species.**NATICA TUOMYANA.*

Shell subglobose, thick and solid; spire not much elevated; volutions four to four and a half, convex, last one crossed by strong folds; suture distinct or slightly grooved; surface marked with fine closely arranged lines of growth, crossed by flat revolving bands; aperture apparently ovate; umbilicus very small or only rudimentary. Length and breadth about .88 inch; apical angle slightly convex; divergence about 110°.

We have seen but one specimen of this species, a portion of the body volution of which is broken away. The outer lip seems to have been bevelled, and joins the body whorl above, at an angle of about 90°. The revolving bands are generally faint, and wider than the grooves between them on the upper part of the whorls, but more distinct and about equal to, or smaller than, the depressions near the middle and below. The inner lip is not callous in the umbilical region.

This species may be at once distinguished from any other known to us from the Nebraska formations, by its greater thickness, and the strong vertical folds and revolving bands. We name it in honor of Prof. M. Tuomy, State Geologist of Alabama and South Carolina.

Locality and position. Mouth of Judith River, in a sandstone, probably the same as No. 1 of the section.

BULLA SUBCYLINDRICA.

Shell elongate oval, or subcylindrical; spire umbilicate; surface (of cast) marked with faint remains of lines of growth, crossed by about forty revolving striae, generally a little narrower than the elevated spaces between. Aperture very narrow, arcuate, extending a little above the summit of the body, and increasing in breadth very gradually from the upper to the lower extremity. Umbilicus small or closed. Length .91 inch; breadth .48 inch. Breadth of aperture near the centre .12 inch; breadth at the widest place below .24 inch.

This species, of which we have seen only a cast, is near *Bulla pupa* of Evans and Shumard, (unpublished MSS.,) but the form of the aperture is quite different, being very narrow, almost linear, excepting at the lower end, where it widens out gradually, on the inner side, to about twice its breadth near the middle, while that of *B. pupa* is "elongate ovate." From our *B. volearia* (Proceedings of the Academy of March last, page 69,) it may be distinguished by its larger size, and the equal breadth of the two ends; it differs from all the other Nebraska species we have seen, in its greater size and much more elongate form.

Locality and position. Near mouth of Milk River, formation No. 4 of the accompanying section.

PANOPAEA OCCIDENTALIS.

Shell elongate ovate; posterior end broader than the anterior, subtruncate and gaping; buccal end narrowly rounded, almost closed; base straight along the middle, rounding up abruptly behind, and gradually in front; cardinal border nearly parallel with the base behind the beaks, and sloping in front; beaks small, rather depressed, incurved, approximate and located a little in advance of the center; surface ornamented by irregular concentric wrinkles or undulations, most distinct on the upper half.

We have but one specimen of this species, which shows none of the internal characters, and has lost its finer surface markings, if there were any, by the exfoliation of the external lamina. It is too imperfect to give exact measurements, though it must have been about 3-10 inches in length, 2 inches high, and 1-42 inches wide. We are in some doubt whether or not it is distinct from a species described by Prof. Tuomy under the name of *P. cratacea*, (see Proceedings of the Academy, Sept., 1854, page 170,) though it is much larger; and it is hardly probable, had his species differed much in the breadth of the two ex-

tremities, he would have omitted to mention it. It is more narrowly rounded in front than any of the casts we have seen from the New Jersey formations, or than any species we have seen figured in foreign works.

Locality and position. Sandstone near mouth of Judith River, probably No. 1 of the section.

MACTRA FORMOSA.

Shell thin, triangular oval, somewhat compressed; cardinal border sloping from the beaks at an angle of about 115° , straight in front, and slightly convex behind the beaks; extremities narrowly rounded, almost angular, nearly alike; base forming a broad regular curve; beaks small, elevated, approximate, central or a little in advance of the middle; surface marked with fine lines of growth, which become stronger and more regular on the large lanceolate lunule and escutcheon. Length 1.70 inches; breadth .82 inch; height 1.36 inches.

The lunule and escutcheon extend from the beaks to the extremities of the shell, the former being slightly impressed, and the latter bounded by a very obscure ridge. By grinding down upon the cardinal edge of a right hand valve, we found it thin, and having under the beaks apparently an oblique cardinal tooth and a small ligamentary pit, the former being divided into two diverging parts; while the anterior and posterior portions of the edge have each a long groove, probably for the reception of slender lateral teeth in the other valve.

Locality and position. Same as last.

MACTRA WARRENANA.

Shell triangular oval, moderately compressed; cardinal border sloping from the beaks at an angle of about 110° ; anterior end narrowly rounded; posterior end wider, rounded or very slightly truncate, and gaping a little at the extremity; base forming a broad curve; beaks elevated, rather small, incurved, nearly central; surface marked with fine lines of growth, which become stronger and more regular on the large lanceolate lunule and escutcheon. Length 1.55 inch; height 1.20 inch; breadth .85 inch.

The muscular impressions are oval or ovate; the anterior one being rounded below, and contracted and prolonged above. The sinus of the pallical impression is small, obtuse at the extremity and nearly horizontal.

This species is nearly related in most of its characters to the last, but may be distinguished by its less compressed form, more elevated and gibbous beaks and thicker shell. We have had no opportunity of comparing their internal characters, nor have we seen the hinge of this species. Their distant geographical, and widely separated stratigraphic positions, in addition to the above named differences, lead us to regard them as distinct.

We name this species in honor of Lieut. G. K. Warren, of the U. S. Topographical Engineers.

Locality and position. Yanktonin trading post, No. 5 of the accompanying section.

MACTRA ALTA.

Shell thin, subtriangular, compressed; cardinal border sloping from the beaks at an angle of about 80° ; base forming a broad regular curve; extremities narrowly rounded or subangular, and nearly alike; posterior slope having an obscure ridge or angle passing obliquely backwards and downwards from the beaks; umbones much elevated, (pointed?) nearly central; surface marked with concentric striae. Length about 2.62 inches; height 2.15 inches; breadth 1.15 inch.

We have not yet had an opportunity of seeing the interior of this shell, nor the details of its hinge, and all our specimens are worn so as to obscure the surface markings. It resembles the last two species, but is larger and much more compressed than either of them, and the much greater elevation of its beaks gives it more nearly the form of an equilateral triangle.

Locality and position. Bad Lands of Judith River; in a sandstone, the position of which is doubtful, but probably No. 1 of the series.

TELLINA SUBTORTUOSA.

Shell elliptical or narrow ovate, compressed; anterior end rounded; posterior side obliquely truncate at the extremity, and having (in the cast) an obscure ridge passing obliquely backwards and downwards from the beaks; base forming a broad curve, a little more prominent before than behind the middle; beaks small, very slightly elevated above the dorsal margin, located a little in advance of the center; surface unknown. Length 2.43 inches; height 1.27 inch; breadth (of left valve) about .22 inch.

The only specimen of this species we have seen is an internal cast of a left valve, with a few fragments of the inner laminae of the shell adhering. On these fragments indistinct traces of radiating lines are visible, though they may have had no connection with external markings. The anterior muscular impression is narrow ovate, placed near the front margin, with the narrow end above, and slightly inclined backwards. The posterior muscular impression is round ovate, located near the upper margin, and about one eighth the entire length of the shell in advance of the posterior extremity; the narrower end being above and inclined obliquely forwards. Sinus of the pallial impression deep, nearly horizontal and apparently rounded at the end. From the inward warping of the back part of the lower border, and the general flatness of this valve, it is probable the other was more convex.

The compressed narrow elliptical form, and slightly elevated beaks, will distinguish this from all the other species known to us from the Nebraska formations.

Locality and position. Mouth of Judith River, from a sandstone supposed to be No. 1 of the series.

VENUS? CIRCULARIS.

Shell very thin, subcircular, rather gibbous; cardinal border rounding from the beaks; extremities and base rounded; beaks located about half way between the center and the buccal border, elevated, pointed, incurved and directed obliquely forwards; muscular impressions very faint, anterior one almost marginal, and near the beaks; surface ornamented with fine concentric lines; sinus of the pallial impression funnel shaped, the apex being directed obliquely upwards towards the beaks. Length .74 inch; height .67 inch; breadth .45 inch.

Not having seen the hinge of this species, we refer it with doubt to the above genus. It may be distinguished from any of the allied Nebraska forms known to us, by its greatest diameter being from the beaks obliquely downwards to a point a little behind the middle of the base, and by its more elevated, pointed, gibbous and oblique beaks.

Locality and position. Just above the mouth of Milk River, No. 4 of the section.

CYTHERRA PELLUCIDA.

Shell extremely thin and fragile, broad ovate or subcircular, compressed; extremities rounded, the posterior end being a little wider than the anterior; base semioval or semicircular; beaks moderately elevated, placed about one-third of the distance from the center towards the anterior end; surface marked with fine regular concentric striae; muscular impressions very faint; sinus of the pallial impression triangular, longer than wide, not quite reaching the middle of the shell, and if continued across would strike the opposite border below the beaks. Length (of ovate variety) 1 inch; height .83 inch; breadth .40 inch.

Amongst the shells we refer to this species, there are two varieties of form, one being less compressed and more nearly circular, with more gibbous beaks than the other; but as there are some intermediate forms, and they agree in all other respects, we are at present inclined to regard them as identical. More

extensive collections, however, may hereafter prove them to be distinct species. This shell may be readily distinguished from a species described by us in the Proceedings of the Academy in April last, under the name of *C. Deweyi*, (page 83,) by its extreme thinness; and from *Venus? circularis* of this paper, by its less elevated and more obtuse beaks, as well as by the widely different form and direction of the sinus of the pallial impression. It is more liable to be confounded with *C. tenuis* of Hall and Meek, (*Mem. Am. Acad. Arts and Sci.* p. 383, plate 1, fig. 8,) but presents in some of its varieties a more oval or ovate form, and is always less broadly rounded at the extremities. In addition to these differences, it comes from a distant locality, and from a higher bed, in which not a single species known to occur in that in which *C. tenuis* is found, has yet been recognized. This and the following species are referred to the genus *Cytherea*, chiefly from external characters, as we have not seen the hinge of either.

Locality and position. Two hundred miles above the mouth of Milk River, No. 4 of the series.

CYTHEREA OWENANA.

Shell round oval, compressed; beaks moderately elevated, placed about half way between the center and the anterior end; cardinal border convex behind and concave before the beaks; extremities rounded, the anal end being broader than the buccal; base semioval; anterior muscular impression narrow ovate, and the posterior round ovate, both pointed above and very shallow; sinus of the pallial impression narrow and deep, directed obliquely upwards towards a point a little in advance of the beaks. Length 1.56 inch; height 1.35 inch; breadth about .66 inch.

The surface markings of our specimen are almost entirely carried away by the exfoliation of the outer laminae of the shell. A small remaining portion near the lower border is marked with small concentric wrinkles and much finer lines of growth. We have not had an opportunity of examining the hinge.

The greater thickness of the substance of the shell will at once distinguish this species from all the allied Nebraska forms known to us, excepting our *C. Deweyi* (see Proceedings of the Academy, April last, page 83) and *C. orbiculata* of Hall and Meek, (*Mem. Am. Acad. Arts and Sciences*, page 382.) From the former it may be known by its much deeper and relatively narrower pallial sinus; that of *C. Deweyi* being in the form of an equilateral triangle, and not reaching the center, while in this it is about one-third deeper than wide, and extends beyond the middle of the shell. They are, moreover, from distant localities, and widely separated stratigraphical positions. From the latter it will be distinguished by its more oval and compressed form and less elevated beaks. We name it after Dr. David Dale Owen, of New Harmony, Indiana.

Locality and position. Mouth of Judith River, from a sandstone supposed to be the same as No. 1 of the series.

LUCINA OCCIDENTALIS.

? *Tellina occidentalis* (Morton.) *Jour. Acad. Nat. Sci.* vol. 8, pl. xi, fig. 3.

Mould of *Lucina?* (Owen.) *Report Wis., Iowa and Min.* tab. vii., fig. 8.

Shell rather thick, transversely oval, compressed; cardinal border slightly concave, and sloping very little in front of the beaks, convex and declining behind; anal end vertically subtruncate at the extremity, and having sometimes a very obscure ridge passing obliquely backwards and downwards from the beaks; anterior end rounded and a little wider than the posterior; base semi-ovate, more prominent before than behind the middle; beaks small approximate, little elevated above the hinge, slightly in advance of the center; lunule very small, lanceolate; surface ornamented by distinct irregular concentric lines. Length (large specimen) 1.90 inch; height 1.56 inch; breadth .94 inch.

By breaking open some of the specimens, we find under the beaks two diverging cardinal teeth in each valve; and in front of these one anterior lateral tooth in the right valve, which fits between two smaller ones in the left. If

there are any posterior lateral teeth they must be small and remote from the beaks. At the anal extremity of each valve there is one shallow muscular impression, of an oval or subquadrate form, with a faint slender ridge passing from its inner side obliquely up towards the beaks. At the buccal end there is in each valve one long shallow, arcuate muscular impression, with its narrower end downwards, and directed a little back, so that more than half of its lower part is detached from the pallial impression. Immediately behind the upper end of this, a second very small circular muscular impression may be seen in each valve. The ligament was chiefly external, and occupied a narrow lanceolate depression behind the beaks; a portion of it, however, was partly internal, being deeply seated between the beaks. Exfoliated specimens show on the internal laminae of the shell, faint radiating lines, which are never visible on the surface.

From the foregoing description it will be seen this species unites characters belonging to two genera. Its form and general appearance, as well as its hinge, and elongated anterior muscular impression, partly detached from the pallial line, are all characters that would place it in the genus *Lucina*; while its double anterior muscular impressions indicate an affinity to the genus *Corbis* of Cuvier.

We are in doubt whether or not this is the shell figured by Dr. Morton under the name of *Tellina occidentalis*. Although certainly not very nearly like his figure, it resembles it more than any other shell we have seen in all the Nebraska collections. It cannot be a *Tellina*, as the pallial impression is unquestionably simple.

Locality and position. Near Milk River, and eighty miles above on the Missouri, also on the Yellowstone and Moreau rivers. Formation No. 4 of present section.

HETTANGIA AMERICANA.

Shell rather thick, ovate or subrhomboidal, compressed; posterior end much broader than the anterior, obliquely subtruncate and gaping; buccal side long, rostrated and closed, very narrowly rounded at the extremity; base forming an elliptical curve, excepting near the anterior end, where it is slightly contracted; dorsal border elevated in the umbonal region, concave in front and convex behind; beaks small, approximate, located a little behind the middle, surface marked with rather faint lines of growth, and sometimes, near the border, with small obscure concentric wrinkles. Length 2.63 inch; height 1.76 inch; breadth 1.25 inch.

We have but one specimen of this species showing the hinge. This is a left valve, in which there is one strong cardinal tooth located very slightly in advance of the point of the beak. Immediately behind this tooth, and directly under the beak, there is a distinct pit, from which a shallow depression passes round the upper side of the tooth. This pit was doubtless occupied by a strong tooth in the other valve. The posterior lateral tooth is prominent, obtuse and compressed, while the cardinal edge between it and the depression under the beak is somewhat callous.

This shell is closely related to two or three of the species figured by Terquem in the Bulletin of the Geological Society of France, (2d ser. t. x. pl. 1, 2,) but is relatively higher in the umbonal region, and more distinctly rostrated in front than any of them. It is also more strongly truncate behind than any of Terquem's species, though it varied somewhat with age in this character.

It is an interesting fact that this, the first species of the genus recognized in this country, is found associated with a small *Baculites*, while all its known congeners in the Old World are peculiar to the Lias.

Locality and position. No. 1. Mouth of Judith River.

CARDIUM SPECIOSUM.

Shell circular or round oval, higher than long, gibbous in the central and umbonal regions; buccal border a little more rounded than the anal; base regularly rounded; beaks elevated, slender, pointed, incurved and nearly central,

very slightly oblique; surface ornamented with numerous simple, slender, radiating costæ, alternating with rows of elevated points of about their own breadth; border crenulated? Length .57 inch; height .67 inch; breadth .48 inch.

In different conditions of weathering the surface markings of this species present a variety of aspects. In some cases the elevated points look as though arranged on costæ, instead of between them, while in other instances only the costæ are to be seen. Usually, however, these elevated points are quite distinct on casts, and so regularly disposed that worn fragments, when seen embedded in the matrix, present much the appearance of bits of *Fenestella*. On some specimens traces of fine concentric striae are visible, curving strongly upwards in crossing the ribs. The shell is so nearly equilateral, and the beaks so slightly oblique, that when viewed on the side it looks much like a *Brachiopod*. We know of no species with which this is liable to be confounded, amongst all the Nebraska shells, and it differs from the allied forms we have seen figured from foreign localities, in having the rows of elevated points of uniform size, and not alternately larger and smaller.

Locality and position. Bad Lands of Judith River, from a sandstone, the position of which is doubtful, but probably No. 1 of the series.

NUCULA OBSOLETASTRIATA.

Shell thick, oval ovate or elliptical, moderately compressed; surface ornamented with fine concentric striae and obscure traces of small closely arranged radiating lines; buccal end obliquely truncated from the beaks forward to a point nearly half way down the front border, where it is narrowly rounded; posterior end more broadly rounded; base semioval, most prominent behind the center; cardinal border sloping from the beaks at an angle of about 120°. Beaks small, rather depressed, nearly touching, and placed a little in advance of the middle; lunule narrow ovate, deeply impressed. Length 1.20 inch; height .81 inch; breadth .60 inch.

The cardinal edge is thinnest near the beaks, from which point it gradually thickens towards the extremities, especially towards the posterior end. We have had no opportunity of ascertaining whether or not the edge of the lower border is crenulated. As the radiating striae are very obscure, it is probable they are obsolete on worn specimens, though on the surfaces of internal laminae they are usually quite distinct. The anterior muscular impression is deeply impressed, of a narrow ovate form, and placed near the edge of the buccal extremity; while the posterior one is a little narrower, less deeply impressed, and located close up under the back end of the hinge. There are about thirty hinge teeth in each valve behind, and nearly half as many before the beaks, all of which are curved in crossing the edge, so as to present the concave sides towards the extremities.

This species will be easily distinguished from all the others known to us from the Nebraska formations, by its larger size and other obvious characters.

Locality and position. Great Bend of the Missouri, No. 4 of the series.

CUCULLÆA NIGRA.

Shell thick, very small, oval cordiform; posterior end obliquely truncate; anterior extremity rounded; base nearly straight; ligament area rather short and straight, marked with longitudinal lines, and in the middle with exceedingly small, regular, closely set transverse striae. Umbonal region gibbous. Beaks elevated, incurved, rather distant, and located a little in advance of the center. Surface ornamented by irregular concentric wrinkles, and very fine lines of growth, crossed by small, regular, faint, closely arranged radiating striae. Length .30 inch; breadth .27 inch; height .27 inch.

The ligament area, which is not much more than half the entire length of the shell, is often bounded by a slightly elevated border. That portion of it marked with transverse striae is margined by a fine impressed hair line, and has in each valve a broad triangular form. The longest sides of these two triangles are

joined together at the hinge, when the valves are united, while the opposite angles terminate immediately under the beaks. Muscular impressions shallow, ovate or oblong, and having a very slightly elevated line passing from the lower inner border of each up towards the beaks. Lateral teeth of the hinge oblique, but not horizontal. The beaks are curved at right angles to the hinge, and slightly angular behind. A neat little shell, not apt to be confounded with any other species known to us.

Locality and position. Quite abundant at the mouth of Milk River, in formation No. 4 of the series.

MYTELUS SUBARQUATUS.

Shell narrow ovate, arcuate; posterior end compressed and rounded; dorsal edge regularly arched and sharp; base nearly straight or slightly arcuate, scarcely carinated; the two edges converging towards the nearly straight, pointed beaks, at an angle of about 35°. Surface unknown. Length 1.03 inch; breadth .27 inch; height .36 inch.

The beaks are nearly or quite terminal, and appear to have been straight or but slightly declining. Our specimen being only an internal cast, shows none of the surface characters, excepting traces of concentric lines of growth. The dorsal border looks as though it had formed a regular curve, without any angle marking the posterior termination of the hinge.

This species is very near *M. lanceolatus* of Sowerby, (Min. Con. pl. 439, fig. 2.) but is proportionally wider behind, and not quite so pointed at the beaks. It is about intermediate in form between that species and *M. edentulus* of the same author.

Locality and position. Dog River, near mouth of Judith River, from sandstone supposed to be No. 1 of the series.

GERVILLA SUBTORTUOSA.

Shell thick, lanceolate, tortuous and laterally curved. Beaks terminal? pointed? posterior end narrow, the widest part being at the back end of the hinge; hinge line straight, forming an angle of about 20° with the longitudinal axis of the shell; ligament fossæ about six, nearly equalling the spaces between. Surface unknown.

Our specimens of this shell consist of fragments, from which it is impossible to make out a complete diagnosis of the species. None of them show the hinge teeth, and they have all lost the surface markings. The largest fragment we have seen (which is imperfect at both extremities) is four inches in length by 1.65 inch in height at the posterior end of the hinge. It retains 2.70 inches in length of the hinge, which is .44 inch in thickness, though some of the outer laminae are wanting, and shows five of the ligament fossæ, of which there may have been one or two more.

When viewed on the side, the outline of this shell is much like *G. aviculoides* of Sowerby, (Min. Con. vol. 6, page 16, pl. 511,) but it is much more curved and twisted, though not so much so, nor so obtuse at the anterior extremity as *Gervilla* (*Gastrochama*) *tortuosa* of the same author. So far as we know, this is the first species of the genus described from the cretaceous rocks of this country. Prof. Tuomy informed us he has found a species in Alabama, but as he has not yet published a description of it, we have no means of instituting a comparison.

Locality and position. Three hundred miles above Fort Union, on the Missouri, No. 4 of the series.

INOCERAMUS PERTENUIS.

Shell very thin, broad ovate or oval, somewhat compressed; cardinal border straight; anterior end rounded; posterior extremity broad, obtusely rounded; base broadly curved. Beaks near the anterior end, rising above the hinge line, nearly touching. Surface irregularly and rather faintly undulated, marked with fine lines of growth. Length about 4.30 inches; height 3.40 inches; breadth 2.20 inches.

It is possible this shell may prove to be only a variety of *I. ventricosus*, described by us from the same locality, in a paper read before the Academy last April. It differs, however, from all the specimens we have seen of that species, in being broader, much more compressed and more regularly marked with concentric undulations. The beaks are also smaller, more elevated above the hinge line, and located a little further back from the anterior margin. It has likewise much the form of *I. convexus* of Hall and Meek, (vol. 5, Mem. Am. Acad. Arts and Sc. page 386, pl. 2, fig. 2,) but may be at once distinguished from that and *I. Sagenis* of Owen, as well as from all the other species we have seen from the higher formations of Nebraska, by the extreme thinness and entire fibrous structure of the shell.

Locality and position. Mouth of Judith river, in a sandstone probably the same as No. 1 of the series.

INOCERAMUS INCURVUS.

Shell ovate, globose or cordiform, equivalve. Beaks located a little behind the anterior end, strongly incurved; umbonal region very gibbous and much elevated above the hinge line. Surface ornamented with regular distinct concentric undulations, strongest near the beaks, where they are directed very obliquely inward toward the hinge, in passing round from the front to the posterior side. Length unknown; breadth 2 inches; height 1.80 inch.

The young of this species, judging from the curve of the undulations near the beaks, must have been of an ovate form, being a little broader behind than in front. As the shell advanced in age it became rapidly more globose, and the beaks curve so strongly inwards, as to bring the umbonal regions of the two valves nearly, if not quite, in contact behind and above the points of the beaks, which are directed away from each other. The substance of the shell is composed of an external fibrous, and an internal lamellar portion, the former being generally exfoliated. The surface was probably marked with concentric striae, though not preserved on our specimen. This shell may be distinguished from all the other species we have seen from this region, by its more globose form, as well as by its strongly incurved and gibbous umbones.

Locality and position. Little Bear's village, between Fort Pierre and Fort Clark, formation No. 4.

OSTRUM PATINA.

Shell circular, oval or ovate, oblique, rather compressed. Superior valve concave above, thin, excepting at the beaks, where it is suddenly thickened and truncate. Inferior valve thicker, concave on the inner or upper side, sometimes auricled; beaks triangular, flat, slightly curved upwards and turned a little towards the anal side. Muscular impression oval or circular, shallow nearest the anal margin. Surface of both valves marked with imbricating lines of growth, and faint irregular concentric undulations. Greater diameter of largest specimen (inferior valve) 3.50 inches; smaller do. 3.10 inches; depth of concavity .70 inch.

The usual form of the shell is nearly circular or broad ovate. The buccal side is short and rounded, while the anal border is longer and sometimes (especially in the inferior valve) contracted above just behind the beaks. The areas of both valves are broad triangular, and as usual depressed in the middle, and transversely striate.

This species is evidently related to *O. vicularis* (Lamk.) of which it may be considered a far western representative. It always differs from that species, however, in having the inferior valve much less concave, more distinctly auricled, and never characterized by a posterior lobe. The beak of this valve is also much less curved upwards, being often almost horizontally flattened. We have some fifteen or twenty specimens of this species, in a good state of preservation, all of which are quite uniform in their characters. None of the beaks show marks of the fracture by which the shell became detached.

Locality and position. Two hundred miles above the mouth of Milk River, No. 4 of the series.

						Eocene.	Miocene.
Gen. PALUDINA.							
P. MULTILINEATA,	Meek and Hayden,	Proc. Acad. N. S. Phila.	vol. 8,	p. 120		*	
P. VETULA,	Meek and Hayden,	"	"	"	121	*	
P. LEAH,	Meek and Hayden,	"	"	"	"	*	
P. RETUSA,	Meek and Hayden,	"	"	"	122	*	
P. CONRADI,	Meek and Hayden,	"	"	"	"	*?	
P. PECULIARIS,	Meek and Hayden,	"	"	"	"	*	
P. TROCHIFORMIS,	Meek and Hayden,	"	"	"	"	*	
P. LEIDYI,	Meek and Hayden,	"	"	"	123	*	
Gen. MELANIA.							
M. MINUTULA,	Meek and Hayden,	Proc. Ac. Nat. Sc. Phila.	vol. 8,	p. 123		*	
M. ANTHONYI,	Meek and Hayden,	"	"	"	124	*	
M. MULTISTRIATA,	Meek and Hayden,	"	"	"	"	*	
M. NEBRASCENSIS,	Meek and Hayden,	"	"	"	"	*	
M. CONVEXA,	Meek and Hayden,	"	"	"	125	*?	
Gen. VALVATA.							
V. PARVULA,	Meek and Hayden,	Proc. Acad. Nat. Sc. Phila.	vol. 8,	p. 123		*	
Gen. CERITHIUM.							
C. NEBRASCENSIS,	Meek and Hayden,	Proc. Ac. N. S. Phila.	vol. 8,	p. 125		*	
Gen. CYCLAS.							
C. FORMOSA,	Meek and Hayden,	Proc. Acad. Nat. Sc. Phila.	vol. 8,	p. 115		*	
C. FRAGILIS,	Meek and Hayden,	"	"	"	"	*	
C. SUBELLIPTICUS,	Meek & Hayden,	"	"	"	"	*	
Gen. CYRENA.							
C. MORRAVENSI,	Meek and Hayden,	Proc. Ac. Nat. Sc. Phila.	vol. 8,	p. 115		*	
C. INTERMEDIA,	Meek and Hayden,	"	"	"	116	*	
C. OCCIDENTALIS,	Meek and Hayden,	"	"	"	"	*?	
Gen. OORBULA							
C. SUBTRIANGULARIS,	Meek & Hayden,	Proc. Ac. Nat. Sc. Phila.	vol. 8,	P. 116		*?	
C. PERUDATA,	Meek and Hayden,	"	"	"	"	*?	
C. MACTRIFORMIS,	Meek and Hayden,	"	"	"	117	*	
Gen. UNIO.							
U. PRISCO,	Meek and Hayden,	Proc. Acad. Nat. Sc. Phila.	vol. 8,	p. 117		*	

CRETACEOUS SPECIES.

	Formations in ascending order.				
	1	2	3	4	5
Gen. CALLIANASSA.					
C. DANAI, Hall & Meek, Mem. Am. Ac. Arts & Sc. Bost. vol. 5, n. s. p. 379	*	
Gen. BELEMNITELLA. D'Orbigny.					
||§ B. MUONONATA,* Schlotheim, sp. Petfr. p. 47, No. 4.....		s?
B? BULBOSA, Meek and Hayden, Proc. Acad. Nat. Sc. Phila. vol. 8, p. 70		*
Gen. NAUTILUS.					
||§ N. DEKAYI, Morton, Synopsis Org. Rem. p. 33.....	*	s?
Gen. AMMONITES					
|| A. PLACENTA, Dekay, Ann. N. Y. Lyc. Nat. Hist. vol. 2, p. 5, fig. 2 (not. 3)	*	s?
|| A. LOBATUS,† Tuomy, Proc. Acad. Nat. Sc. Phila. vol. 7, p. 168.....		*
A. lenticularis, Owen, Rept. Iowa, Wisconsin and Min. tab. 8, fig. 5.....		
A. OPALIS, Owen, " " " " " 6.....	*	
A. COMPLEXUS, Hall and Meek, Mem. Am. Ac. Arts & Sc. vol. 5, n. s. p. 394	*	
A. PERCARINATUS, Hall and Meek, " " " " " 396	*	
A. HALLI, Meek and Hayden, Proc. Acad. Nat. Sc. Phila. vol. 8, p. 70.....	*	
Gen. TURRILITES.					
T. NEBRASCENSIS†.....		
Ancylloceras? Nebraskaensis, Meek and Hayden, Proc. Ac. Nat. Sc. Phila. vol. 8, p. 71.....	*	
T. CHEYENNEENSIS.....		*
Ancylloceras? Cheyennensis, Meek and Hayden, Proc. Ac. Nat. Sc. Phila. vol. 8, p. 71.....	*	

NOTE.—This mark (||) indicates that the species is also known to occur in the States; this (§) that it is common to this country and the old world; and these two (||§) that it occurs both in the States and on the other side of the Atlantic.

* We place this species in the list of Nebraska Fossils, on the authority of Dr. Morton, (see *Belemnites mucronatus*, Jour. Acad. Nat. Sc. vol. 8, p. 211) not having recognized it in any of the collections we have seen from that region.

† Adult specimens of this shell almost equal in size the largest individuals of *A. placenta*, with which species it is apt to be confounded. They may always be distinguished, however, by external characters, even when the septa cannot be seen; the dorsal margin of the former being thin and sharp, especially in young individuals, while that of *A. placenta* is always flattened immediately on the edge. It is a little remarkable that Dr. Dekay's original description agrees more nearly with this shell than with that referred by Morton and others to *A. placenta*, while his figure is more like the latter. Possibly he may have had fragments of both species before him.

Suspecting our Nebraska shell might be identical with a species indicated by Prof. Tuomy, from Mississippi, under the name of *A. lobatus*, we sent him drawings of one of our specimens, showing its form and all the details of the septa, since which he writes he has no doubt of their identity. As the name *lenticularis* was previously applied to one or two other species, that given this shell by Prof. Tuomy will have to take precedence, though published after Dr. Owen's.

‡ Having at first only unsatisfactory fragments of this and the following species, we were much puzzled in regard to their affinities, and referred them provisionally to the genus *Ancylloceras*. Better specimens recently received, prove them to be *Turrilites*.

	Formations in ascending order.				
	1	2	3	4	5
Gen. ANCYLOCERAS.					
A? NICOLETTI, Hall and Meek, Mem. Am. Ac. Arts & Sc. Bost. vol. 5, new ser. p. 397.....					*
A. MORTON, Hall and Meek, Mem. Acad. Arts & Sc. Bost. vol. 5, new ser. p. 396 (see corrections at end of that memoir).....					*
Gen. BACULITES.					
|| B. OVATUS, Say, Jour. Ac. Nat. Sc. Phila. vol. 7, pl. 5, fig. 5 and 6.....				*	a?
B. COMPRESSUS, Say, Am. Jour. Sc. vol. 11, p. 41.....				*	
B. GRANDIS, Hall & Meek, Mem. Am. Ac. Arts & Sc. Bost. vol. 5, n. s. p. 402.....				*	
Gen. SCAPHITES.					
|| S. CONRADI,* Morton, sp.....					*
Ammonites Conradi, Morton, 1834, Synopsis Org. Remains, p. 39.....					
A. Nebraskaensis, Owen, Report Iowa, Wis. and Minn. tab. 8, fig. 3 and 3a, tab. 8a, fig. 2.....					
A. Nebraskaensis? Owen, Report Iowa, Wis. and Minn. tab. 8, fig. 2.....					
A. Morcauensis, Owen, " " " " fig. 7.....					
A. Chyennensis, Owen, " " " " tab. 7, fig. 2.....					
S. MANDANENSIS,† Morton, sp.....					*
Ammonites Mandanensis, Morton, Jour. Acad. N. S. Phila. v. 8, p. x. fig. 2.....					
A. abyssinus, Morton, " " " " " 1.....					
A. Mandanensis? Owen, Report Iowa, Wisc. and Minn., tab. 7, fig. 5.....					
S. NICOLETTI, Morton, sp. 1841, Jour. Acad. N. S. Philad. vol. 8, pl. 10, fig. 3.....				*	*
S. compressus, Owen, 1852, Report Iowa, Wisc. and Minn., tab. 7, fig. 5.....					
Ammonites Nicoletti, Morton, Jour. Acad. N. S. Phila. vol. 8, pl. x. fig. 3.....					
S. NODOSUS Owen, (not of others.) Rep. Iowa, Min. & Wis. tab. 8, fig. 4 and 4.....					*

* Of this truly protean species we have a fine collection of beautiful specimens from the same locality and position as those investigated by Dr. Owen. These we find agree in all respects with his figures, and only differ from his descriptions in always exhibiting, when the matrix is cleared out from the umbilicus, six or seven volutions, instead of one and a half to three and a half. A critical comparison of our specimens, with Dr. Owen's figures and Dr. Morton's original specimens in the cabinet of the Academy at Philadelphia, as well as with others from Alabama, loaned us by Prof. Winchell, leads us unavoidably to the conclusion, that they all belong to one exceedingly variable species, in which opinion Mr. Conrad, who has looked over our specimens, concurs with us. *A. Nebraskaensis*, *A. Morcauensis*, and *A. Chyennensis* of Owen, are the inner volutions of one strongly marked variety having a larger umbilicus, narrower volutions and stronger costae. It is difficult to believe this is not a distinct species, yet after a very careful comparison, we cannot see any difference between the septa of shells having these characters, and those of well marked specimens of *S. Conradi*.

† We have perfect specimens of this species, which prove it to be a true *Scaphites*. Like *S. Conradi*, it invariably shows, when the matrix is removed from the umbilicus, about seven volutions. When divested of the outer whorls, it is so nearly like Dr. Morton's figures of his *Ammonites abyssinus*, that we cannot see the slightest difference; the perforate character of the umbilicus in the specimen figured by him, being probably due to accident. The lobes of the septa of this species are very nearly like those of *S. compressus* of Owen, yet we have seen no intermediate gradations of external form connecting those two, like those between the different varieties of *S. Conradi*. We find it exceedingly difficult to define limits between species amongst these Nebraska *Scaphites*. The position and relative size of nodes and costae, as well as the more or less compressed form of the shell and relative size of the umbilicus, are not, within a considerable range of limits, characters that can always be relied upon. One of our specimens of *S. nodosus*, (Owen) for example has near the dorso-lateral margin of one side, the usual row of nodes, and none at all on the other.

	Formations in ascending order.				
	1	2	3	4	5
Gen. SCALARIA.					
S. CERITHIFORMIS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., v. 8, p. 63	*
Gen. TURRITELLA.					
T. CONVEXA, Meek & Hayden, Proc. Acad. Nat. Sci. Philada., vol. 8, p. 70	?
T. MORRAUENSIS, Meek & Hayden, " " " "	*
Gen. ACTEON.					
A. CONCINNUS, Hall & Meek, Mem. Ac. Arts & Sci. Bost., v. 8, N. S., p. 390	*
A. SUBELLIPTICUS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., v. 8, p. 63	*
Gen. AVALANA.					
A. SUBGLOBOSA, Meek & Hayden, Proc. Acad. Nat. Sci. Philada., v. 8, p. 64	*
Gen. NATICA.					
N. TUOMYANA, Meek & Hayden, (see accompanying paper.)	*
N. OBLIQUATA, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 389	*
N. CONCINNA, Hall & Meek, " " " "	*
N. PALUDINIFORMIS, Hall & Meek, " " " "	*
N? AMBIGUA, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 64	*
N. SUBCRASSA, Meek & Hayden, " " " 87	?
N. OCCIDENTALIS, Meek & Hayden, " " " 64	*
N. MORRAUENSIS, Meek & Hayden, " " " 64	*
Gen. SOLARIUM.					
S. FLEXISTRATUM, Evans & Shumard, Proc. Ac. Nat. Sc. Phila., v. 7, p. 163	*
Gen. TURBO.					
T. NEBRASCENSIS, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., v. 8, p. 64	*
T. TENUILINEATUS, Meek & Hayden, " " " "	*
Gen. ROSTELLARIA.					
R. NEBRASCENSIS, Evans & Shumard, Proc. Ac. Nat. Sc. Phila., v. 7, p. 164	*
R. FUSIFORMIS, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 393	*
R. BIANGULATA, Meek & Hayden, Proc. Acad. Nat. Sci. vol. 8, p. 65	*
Gen. FUSUS.					
F. SHUMARDII, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 391	*
F? TENUILINEATUS, Hall & Meek, " " " "	*
F. DAKOTAENSIS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 65	*
F. GALPINIANUS, Meek & Hayden, " " " "	*
F. CONTORTUS, Meek & Hayden, " " " "	*
F. CULBERTSONI, Meek & Hayden, " " " "	*
F. FLEXUOCOSTATUS, Meek & Hayden, " " " "	*
F. NEWBERRYI, Meek & Hayden, " " " "	*
Gen. BUSYCON.					
B. BAIRDI, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 126	*
<i>Pyrula Bairdi</i> , Meek & Hayden, " " " "	*
Gen. FASCIOLARIA.					
F. CERTACHA, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 63	*
F. RUCCINOIDES, Meek & Hayden, " " " " p. 67	*

Genus MELEAGRIS, Linn.

MELEAGRIS GALLAPAYO, Linn.—The Wild Turkey.

Formerly very numerous. They have now become almost extinct in this section. A very few, however, still linger amongst us.

Genus ORTYX, Steph.

ORTYX VIRGINIANUS, Linn.—The American Quail.

Still quite numerous, though gradually diminishing in numbers. Here they are clearly not migratory, but upon the Illinois, Mississippi and Missouri rivers they are said to be so. Late in September and in October they seem to have a kind of undefined idea of migrating, and wander around apparently without any fixed object; but in a short time they become quiet and settle themselves into winter quarters, which they never desert until spring, unless the supply of food fails. They may always be found within a few rods of the same place during the winter if the supply of food is sufficient for their wants. During their "crazy fit" in the fall, they come into the town, and when frightened by the boys will frequently fly against the *white* houses, often, as I have witnessed, with such force as to kill themselves. I have known the same thing to happen on one occasion in the country, when there was but a single white house against which they could fly. They very rarely fly against houses of any other color.

Genus TETRAO, Linn.

TETRAO UMBELLUS, Linn.—Called here the Pheasant.

These beautiful birds were formerly extremely plenty, but have now become rare.

Genus CHARADRIUS, Linn.

CHARADRIUS VOCIFERUS, Wils.—Killdeer Plover.

These curious noisy birds are very numerous about all our streams and wet lands.

CHARADRIUS HELVETICUS.—Plover.

Not numerous, though occasionally seen in spring and fall.

CHARADRIUS MARMORATUS.

Similar in numbers to the former.

Genus GRUS, Linn.

GRUS CANADENSIS, Temm.—The Sand-hill Crane.

I have seen but two or three individuals of this species in this region. In the north western part of the State they are very numerous. In the Kankakee and Calumet swamps, which occupy so large a space in north western Indiana and north eastern Illinois, they build their nests and rear their young. If they were the young of the *Grus Americanus*, as some here supposed, they would not likely be found breeding here and producing others like themselves, none of which much resemble the latter. They are distinct birds, and vary greatly both in color and size.

A gentleman who lives upon the Iroquois, in Jasper co., Ind., informed me that he shot a white crane there in 1848, (*G. Americana*), which measured nearly seven feet from the point of the bill to the end of the toes, and weighed, he judged, about *thirty* pounds.

Genus NUMENIUS.

NUMENIUS LONGIROSTRIS, Wils.—Long-billed Curlew.

A few of these birds have been seen here.

Genus ARDEA, Linn.

ARDEA HERODIAS, Linn.—Great Blue Heron.

Quite abundant during the warmer seasons of the year.

ARDEA CANDIDISSIMA.—The Snowy Heron.

Quite numerous some years along White Water, in August, September and October.

ARDEA EXILIS(?).—Least Bittern.

Very numerous along all our streams. Builds its nest in apple-trees and other scrubby trees in the vicinity of rivers. I am not sure that this is not the Green Heron of naturalists (*A. virescens*).

ARDEA LENTIGINOSA.—The American Bittern.

I have seen but three birds of this species in this part of the State. They are quite numerous on the Iroquois and Kankakee in the N. West. The people there call them "*thunder-pumpers*;" hence I infer that their love-call is equivalent to the booming of the European Bittern.

Genus IBIS, Moehr.

IBIS LOGULATOR.—The Wood Ibis.

The first day of August, 1855, a large flock of these birds made their appearance in this neighborhood. They remained along the river and White Water canal for about a month or six weeks. A son of one of my neighbors broke the wing of one of them and caught it. After keeping it three or four weeks, feeding it upon fish, he gave it to me. I kept it until near the first of November, when it fell a victim, as many another biped has done, to its appetite. Some mackerel had been placed to soak upon a table in the back yard, one of which he stole and ate, and upon the evening of the next day died in convulsions.

It was wonderful to see with what rapidity it could swallow live fish from three to ten inches long, almost as rapidly as a chicken would grains of corn.

It became so tame whilst I kept it that it would come into the house when hungry. In that short time it learned to know its name (*Tantalus*), and would come when called, if it happened to be hungry. We learned it to eat raw meat, by putting it into water where it had been fed on fish.

When not hungry it would remain constantly on a certain spot in the yard, and seemed to have no disposition to leave it, except in search of food. It would stand for hours perfectly still, with its long bill hanging straight down along the neck. When tired of this position it would lay the tarsus flat upon the ground and stand upon the lower end of the tibia. It was perfectly harmless and gentle, and possessed much more good sense and sagacity than its appearance would seem to justify.

Genus TOTANUS, Bechst.

TOTANUS FLAVIPES, Gmel.—Little Yellow Shank Tattler.

Not very numerous. Occasionally seen along the river.

TOTANUS MELANOLEUCUS, Gmel.—Great Yellow Shank Tattler.

Occasionally seen in fall and spring.

TOTANUS SEMIPALMATUS, Gmel.—The Willet.

These birds are rare, though flocks occasionally appear late in the fall and early in the spring.

Genus TRINGOIDES, Bonap.

TRINGOIDES MACULARIA, Linn.—Spotted Sandpiper.

Rather numerous along all our streams.

TRINGOIDES BARTRAMICUS, Wils.—Upland Plover.

Very rare. I do not remember ever to have seen but two or three of these birds in this neighborhood.

Genus *TRINGA*, Say.*TRINGA SCHINZII*.—Schinz's Sandpiper.

Quite a number may be found along our streams. Also, one or two others of the same genus, which I cannot name, for the want of figures and descriptions.

Genus *SCOLOPAX*, Linn.*SCOLOPAX MINOR*, Wils.—The American Woodcock.

Formerly more numerous than at present. A few are still to be found here every year.

SCOLOPAX WILSONII.—English Snipe, Jack Snipe.

Sometimes quite numerous in March and April.

Genus *RALLUS*, Linn.*RALLUS CAROLINUS*, Wils.—The Carolina Rail.

I have seen but four of these birds in this section. They are to be found in September on the Kankakee in large numbers.

Genus *FULICA*, Linn.*FULICA AMERICANUS*, Gmel.—The Coot or Mud-hen.

I have occasionally seen considerable numbers of these birds about our streams, who had been compelled to stop by fatigue or storms to rest, before renewing their journey to the South. They are not natives of the soil.

Genus *ANSER*, Barrere.*ANSER CANADENSIS*.—The Wild Goose.

Seen in large flocks every fall and spring in their semi-annual migrations. They rarely ever stop, except they become bewildered during dense fogs.

ANSER BERNICLA, Aud.—The Brent Goose.

Occasionally seen passing over during their migrations. This and the Wild Goose are the only two species I have ever observed here.

Genus *ANAS*, Linn.*ANAS SPONSA*, Wils.—The Wood Duck.

Still seen in considerable numbers, though not so numerous as formerly. They breed here occasionally in the hollow trees.

ANAS AMERICANA, Aud.—The Widgeon.

Occasionally seen in our waters.

ANAS ACUTA, Wils.—The Pintail Duck.

Very common in White Water.

ANAS BOSCHAS, Linn.—The Mallard.

The most numerous of all the wild ducks.

ANAS CRECCA, Wils.—The Green winged Teal.

Quite common in the spring.

ANAS DISCOORS, Wils.—The Blue winged Teal.

Sometimes very numerous in September and October.

ANAS STREPERA, Linn.—The Gadwall Duck.

Have been seen here, but are rare.

ANAS CLYPEATA, Aud.—The Shoveller Duck.

Frequently seen in spring.

ANAS VALISNERIA, Wils.—The Canvas-back Duck.

This far-famed duck made its appearance here for the first and only time, so far as my knowledge extends, in March, 1855. One of my friends shot one which I had a chance to examine, and afterwards to taste. It was very tender and juicy, but had such a fishy flavor that it could scarcely be eaten. I supposed they had come from the sea coast of the Southern States, where they had fed upon shell fish instead of eel grass, which seems to be necessary to perfect their flavor.

ANAS PERINA, Wils.—The Pochard or Red-head.

This duck made its first appearance, so far as known, about the time or in company with the Canvas-back. One or two of them were killed.

ANAS MARILA, Wils.—Scaup Duck.

Occasionally seen but not numerous.

ANAS RUFITORQUES, Aud.—Tufted Duck.

About as numerous as the Scaup.

ANAS OBSCURA, Wils.—The Black Duck.

Frequently seen in Fall and Winter.

FULIGULA MARILA, Aud.—Lesser Scaup Duck.

Was noticed here in 1855.

FULIGULA RUBIDA, Bonap.—Ruddy Duck.

Occasionally seen in spring.

FULIGULA CLANGULA.—Golden-eye Duck.

I killed one of these birds in March, 1855, and saw several others.

FULIGULA ALBOLA.—Butter Ball Duck.

These are probably more numerous in the spring than any other species.

Genus MERGUS.**MERGUS MERGANSER.—The Shelldrake.**

These birds are very numerous in White Water during the whole winter, which they visit for the purpose of fishing. The stream is remarkably clear and being very rapid, seldom freezes over, but the water becomes cold enough to benumb the fish, which thus fall an easy prey to these expert divers. I have known one of them to hatch and rear its brood in this vicinity.

MERGUS UCULLATUS.—Hooded Merganser.

I have seen but a single individual of this species, which was killed in March, 1855.

In addition to the ducks above enumerated, there are some others, but for the want of descriptions and figures I am unable to name them.

Genus COLYMBUS.**COLYMBUS GLACIALIS.—The Loon.**

The loon is frequently seen in our waters in the fall and spring, being probably compelled by fatigue to stop and recruit their strength. Those which I have seen in the water were great divers, but could not be forced to take wing. The cry or wail of the Loon is, to my ear, the most melancholy sound I have ever heard, conveying the idea of utter hopelessness and despair.

COLYMBUS ———.—The Ludapper.

These birds are rather abundant during October and November.

Genus PELECANUS.**PELECANUS ONOCROTALUS.—American White Pelican.**

I have seen a few pelicans flying over; they are, however, very rare in this section.

Genus STERNA.

STERNA DOUGALLII.—The Roseate Tern.

I do not recollect to have seen but a single individual of this species.

STERNA ARCTICA.—Black-capped Tern.

I have seen several flocks of these birds, generally in the month of June, during freshets and storms.

Genus LARUS.

LARUS LEUCOPTERUS, Aud. (?)—White-winged Gull.

Very common along the river during the winter. Besides this, there are several other species of Gull occasionally seen passing through the country.

On a new and remarkable genus of Ranidae, from the river Parana.

By EDW. HALLOWELL, M.D.

Gen. TRIGONOPHRYS.

Char. Head very large, depressed; upper eyelid triangular; tongue large, subcircular, notched in front and posteriorly, more deeply behind, attached in front, free laterally and in its posterior half; upper maxillary teeth large, conical, recurved, sharp-pointed; two groups of vomerine teeth on a line with the anterior margin of the posterior nares, nearer to them than to each other; posterior nares large, subcircular; eustachian foramina of moderate size, rather large; no vocal vesicles either internal or external; tympanum indistinct; four fingers completely free; toes palmate at their base only; first cuneiform bone presenting a prominence externally, with a well defined projecting edge; transverse processes of the sacral vertebræ not dilated.

TRIGONOPHRYS RUGIOPE, nob.

Char. Body thick and stout, more or less covered with tubercles above; two movable bucklers beneath the skin, posterior to the occiput; two glands upon the upper surface of each thigh near the groin; two others larger upon the breast; ground color of body and sides olive, presenting numerous dark colored, ovoid spots, with a narrow margin of white, the interspaces in the immature specimens of a beautiful rose color; extremities olive, with large and broad bands of black margined with white, the interspaces more or less tinged with red; under parts white mingled with yellow; chin and throat black spotted.

Dimensions. Length of head 1 inch 4 lines; greatest breadth 2 inches $3\frac{1}{2}$ lines; breadth of bucklers 1 inch $7\frac{1}{2}$ lines; length of body 3 inches; breadth 3 inches 2 lines; length of anterior extremities $2\frac{1}{2}$ inches; of posterior extremities 4 inches.

Gen. Remarks. A more detailed description with drawings, and an account of the anatomy, will be given in the next volume of the Journal. It differs from *Ceratophrys*, to which it is closely allied, in the shape of the eyelids, the form of the body, the structure of the skull, and the teeth, which are remarkable for their great development.

ELECTION.

Mr. Frederick G. Hesse, of Washington, and Drs. Geo. J. Ziegler and John H. Packard, of Philadelphia, were elected Members; and Philip Lutley Sclater, M. A., of London, and the Right Revd. Stephen Elliott, Bishop of Georgia, were elected Correspondents of the Academy.

December 2d, 1856.

DR. BRIDGES, Vice President, in the Chair.

Letters were read—

From P. L. Selater, dated Philadelphia, Nov. 30th, 1856, acknowledging his election as a Correspondent of the Academy.

From Dr. W. A. Hammond, dated Fort Riley, Kansas Territory, Nov. 11th, 1856, transmitting donations to the Museum.

Dr. Leidy announced that the skin of the Walrus, presented by S. Drinker, Esq., of Hong Kong, China, had been mounted and placed in the Museum.

Mr. Vaux, on behalf of the Publication Committee, announced the publication on the 18th November, of part 3, vol. iii. of the Journal of the Academy.

On leave granted, Dr. Le Conte offered the following resolutions, which were adopted:—

Resolved, That Messrs. Trübner & Co., of London, be appointed agents in Europe for the publications of the Academy.

Resolved, That the Committee on Proceedings be directed to prepare a circular, to be directed to the Members and Correspondents of the Academy, soliciting subscriptions to its publications.

Resolved, That the Committee on Proceedings be directed to consider the expediency of raising the price of the printed Proceedings of the Academy, and to report at the next meeting for business.

December 9th.

DR. BRIDGES, Vice President, in the Chair.

Letters were read—

From the Royal Society of Sciences of Upsal, dated Nov. 16th, 1855; from the Imperial Royal Geological Institute of Vienna, dated March 20th, 1856; and from the Zoologico-Botanical Society of Vienna, dated May 10th, 1856, severally transmitting donations to the Library.

From E. J. Lowe, dated Highfield House Observatory, Nov. 18th, 1856, transmitting a copy of his Natural History of Ferns.

From the Imperial Academy of Sciences of Vienna, dated April 15th, 1856, acknowledging the receipt of the Journal of the Academy, and desiring certain back numbers. Referred to the Publication Committee.

Dr. Leidy presented for publication in the Proceedings, a paper entitled, "Remarks on certain extinct species of Fishes. By Joseph Leidy, M. D.;" which was referred to a Committee consisting of Mr. Lea, Mr. Lesley and Dr. Le Conte.

Mr. Lea read a letter from Dr. McChesney, of Quincy, Illinois, accompanying a box of Naiades, acknowledged this evening.

Mr. Lesley made some remarks upon a Hæmatitic geode, found near Marietta, Pa., which was filled with pure drinkable water instead of the usual clayey matter; he also alluded to another, which was filled with a cubical crystal of galena.

Genus *MUSCICAPA*, Linn.*MUSCICAPA OLIVACEA*, Wils.—Red-eyed Greenlet.

These birds are so numerous, that a traveller through our woods is scarcely ever out of the sound of their voices.

MUSCICAPA CANTATRIX, Wils.—White-eyed Fly-catcher.

Very numerous.

Genus *SYLVIA*.*SYLVIA SOLITARIA*, Wils.—Yellow Warbler.

Very common.

SYLVIA AESTIVA.—Blue-eyed Yellow Warbler.

Quite numerous.

SYLVIA PENNSILIS, Aud.—Yellow-throated Warbler.

Quite common.

SYLVIA MACULOSA, Aud.—Black and Yellow Warbler.

Not very numerous.

Genus *SIALIA*, Swains.*SIALIA WILSONII*, Swains.—The Common Blue Bird.

This interesting and familiar bird is very numerous and remains with us the whole year round.

Genus *PARUS*, Linn.*PARUS ATRICAPILLUS*, Linn.—Black-capped Chickadee.

This sprightly little bird is very common.

PARUS BICOLOR, Wils.—Great-crested Chickadee.

Also numerous, but probably not so much so as the preceding species.

Genus *LANIUS*, Linn.*LANIUS EXCUBITOROIDES*, Swains.—Gray Shrike.

Occasionally seen in autumn and winter. In Nov. 1854, whilst hunting for quails, I saw a Butcher Bird, flying with a Goldfinch (*Chrysomitris tristis*) in its talons. A short time afterwards, going in the direction which it flew, I discovered it upon a small elm tree, having suspended the bird by sticking its neck into the cleft of a split limb, and from which it was pulling off pieces and eating at its leisure. The idea instantly occurred to me that the habit this bird has of sticking pieces of flesh and insects upon thorns and other sharp substances, may be accounted for upon the ground that they do it as a matter of convenience in eating (saving the labor of holding them with their feet, which are rather feeble,) and not for the purpose of decoying other birds, as many have supposed.

Genus *CYANOCORAX*, Boie.*CYANOCORAX CRISTATUS*, Linn.—Blue Jay.

Very numerous, and so tame that they very frequently build their nests in the fruit trees and lilac bushes, in the town, close to our doors.

Genus *CORVUS*, Linn.*CORVUS CORAX*.—The Raven.

Formerly very numerous, but now exceedingly rare, so much so, that I have seen but one for eight or nine years.

CORVUS AMERICANUS, Aud.—American Crow.

Quite numerous in warm weather, both winter and summer, but never seen in times of extreme cold.

Genus *STURNELLA*, Aud.*STURNELLA LUDOVICIANA*.—The Meadow Lark.

This bird is quite abundant here, but vastly more numerous in the north western part of the State, and in all other prairie countries where I have been, they seem to be the most numerous bird, except, perhaps, the Red-winged Blackbird. I can see no difference between this bird and the lark called *S. neglecta*. They are probably the same.

Genus *QUISCALUS*, Vieill.*QUISCALUS VERSICOLOR*, Aud.—Crow Black Bird.

These birds are very numerous except in winter. They are among the first to arrive in the spring. They build their nests always in the hollow tree tops. About the middle of June to the first of July they collect in flocks, and move off to the North, and we see no more of them until October, when they again make their appearance in large flocks, and move off southward.

QUISCALUS FERRUGINEUS, Aud.—Rusty Gracker.

Frequently seen in spring and fall.

Genus *IOTERUS*.*IOTERUS FEOCERIS*, Aud.—Cow Bunting.

I have never known this bird to breed here. They are frequently seen in spring and autumn during their migrations.

Genus *XANTHORNUS*, Cuv.*XANTHORNUS VARIUS*, Gmel.—Orchard Hangnest or Oriole.

This lively and noisy bird is very abundant. During the breeding season the male sings almost without intermission.

Genus *YPHANTES*, Vieill.*YPHANTES BALTIMORE*, Linn.—Baltimore Oriole.

This beautiful bird is very numerous in all the country west of the Alleghany Mountains. I am of opinion that the song of the bird here, varies a little from the song of those found in Virginia, though in all other respects they seem to be identical.

Genus *AGELAIUS*, Vieillot.*AGELAIUS PHENICEUS*, Linn.—Marsh Blackbird.

Very numerous in the neighborhood of all swamps and streams. In the north western part of the State they are found in almost countless numbers.

Genus *DOLICHONYX*, Swains.*DOLICHONYX ORYZIVORUS*, Linn.—Wandering Rice Bird, Bob-o-link.

I have, in three or four different years, seen a few of these birds in the months of May and June. They never breed here.

Genus *CARDINALIS*, Bonap.*CARDINALIS VIRGINIANUS*.—Grosbeak, Red Bird.

Numerous all through the country.

Genus *PIPILO*, Vieill.*PIPILO ERYTHROPHthalmus*, Linn.—Towke Ground Finch.

Quite abundant.

	Formations in ascending order.				
	1	2	3	4	5
Gen. TELLINA.					
T.? CHEYENNEENSIS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 83	?				
T. EQUILATERALIS, Meek & Hayden, " " " "				*	
T. SCITULA, Meek & Hayden, " " " "					*
T. SUBELLIPTICA, Meek & Hayden, " " " " p. 83					*
T. PROUTTI, Meek & Hayden, " " " "				*	
T. SUBTORTUOSA, Meek & Hayden, (accompanying paper).....	?				
Gen. CYTHEREA.					
C. MISSOURIANA, Morton, Jour. Acad. Nat. Sc. Phila., vol. 8, p. 210.....					?
C. ORBICULATA, Hall & Meek, Mem. Am. Ac. Art. & Sc. Bost., v. 5, N. S. p. 382		*			
C. TENNIS, Hall & Meek, " " " " 383		*			
C. DEWEYI, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 83.....					*
C. NEBRASKEENSIS, Meek & Hayden, " " " "					*
C. PHYLLOIDA, Meek & Hayden, (accompanying paper).....				*	
C. OWENIANA, Meek & Hayden, " " " ".....	?				
Gen. VENUS.					
V.? CIRCULARIS, Meek & Hayden, (accompanying paper).....				*	
Gen. LEDA.					
L. VENTRICOSA,.....					*
Corbula ventricosa, Meek & Hayden, Proc. Ac. Nat. Sc. Phila., v. 8, p. 83					*
L. MORRAUENSIS,.....					*
Corbula Morrauenssis, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 83.....					
Gen. CORBULA.					
C.? GREGARIA, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 84				*	
Gen. THRACIA.					
T.? GRACILIS,*.....		*			
Tellina gracilis, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., v. 8, p. 82					
Gen. ASTARTE.					
A. GREGARIA, Meek & Hayden, Proc. Acad. Nat. Sci. Phila., vol. 8, p. 84...					*
Gen. CRASSATELLA.					
C. EVANSI, Hall & Meek, Mem. Am. Acad. Art. & Sc. Bost., v. 5, N. S. p. 383				*	
Gen. LUCINA.					
L. SUBUNDATA, Hall & Meek, Mem. Am. Acad. Arts & Sci. Bost., vol. 5, New Ser. p. 382.....				*	
L. OCCIDENTALIS, Meek & Hayden, (accompanying paper).....				*	
? Tellina occidentalis, Morton, Jour. Acad. Nat. Sc. Phila., v. 8, pl. xi. fig. 3					
Mould of Lucina? Owen, report, Iowa, Wis. and Min. tab. vii. fig. 8.....					
Gen. HETTANGIA.					
H. AMERICANA, Meek & Hayden, (accompanying paper).....		*			
Gen. CARDIUM.					
C. SPECIOSUM, Meek & Hayden, (accompanying paper).....	?				

* Although now satisfied this species is not a *Tellina*, we are still in doubt about its affinities, and place it provisionally in the above genus, until specimens showing the hinge and interior can be seen.

Formations in
ascending order.

1 2 3 4 5

Gen. NUOULA.

N. SUBNASUTA, Hall & Meek, Mem. Ac. Arts & Sci. Bost., v. 5, N. Ser. p. 384	...	...	...	...	...
N. VENTRICOSA, Hall & Meek, " " " " 385	...	...	...	...	...
N. SCITULA, Meek & Hayden, Proceed. Acad. Nat. Sci. Phila., vol. 8, p. 84	...	...	...	...	...
N. EVANSI, Meek & Hayden, " " " " "	...	...	...	...	...
N. EQUILATERALIS, Meek & Hayden, " " " " "	...	...	...	...	...
N. SUBPLANA, Meek & Hayden, " " " " 85	...	...	...	...	...
N. GANCELLATA, Meek & Hayden, " " " " "	...	...	...	...	...
N. PLANOMARGINATA, Meek & Hayden, " " " " "	...	...	...	...	...
N. OBSOLETASTRIATA, (accompanying paper).....

Gen. PECTUNCULUS.

P. STOUXENSIS, Hall & Meek, Memoirs Am. Ac. Art. & Sci. v. 5, N. S. p. 384
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Gen. SIMOPSIS.

L. PARVULA.....
<i>Pectunculina parvula</i> , Meek & Hayden, Proc. Ac. Nat. Sc. Phila., v. 8, p. 85

Gen. CUOULLÆA.

C. NEBRASCENSIS, Owen, Rept. Iowa, Wis. and Min. tab. vii. fig. 1 and 1a	...	...	...	...	...
C. CORDATA, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 86.....	...	...	...	...	...
C. SHUMARDI, Meek & Hayden, " " " " "	...	...	...	...	...
C. EXIGUA, Meek & Hayden, (see accompanying paper).....	...	...	...	...	...

Gen. MYTELUS.

M. ATTENUATUS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 86	...	...	...	...	...
M. GALPINIANUS, Evans & Shumard, " " " " vol. 7, p. 164	...	...	...	...	...
M. SUBARCATUS, Meek & Hayden, (see accompanying paper).....	...	...	...	...	...

Gen. AVICULA.

A. TRIANGULARIS, Evans & Shumard, Proc. Ac. N. Sc. Phila., v. 7, p. 163	...	...	...	...	...
A. LINGUIFORMIS, Evans & Shumard, " " " " "	...	...	...	...	...
<i>Avicula</i> , undt. Owen's Report, Iowa, Wis. and Min. tab. vii. fig. 10.....	...	...	...	...	...
A. HATDENI, Hall & Meek, Mem. Acad. Arts & Sci. Bost., v. 5, N. Ser. p. 382

Gen. GERVILIA.

G. SUBTORTIOSA, Meek & Hayden, (see accompanying paper).....
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Gen. INOCERAMUS.

§1. PROBLEMATICUS, Schlotheim, sp. 1820. Petr. p. 313.....
<i>I. myteloides</i> , Mantell, Geol. Suss. p. 215, pl. 28, fig. 2.
|| (?) 1. BARABINI, Morton, Synopsis Org. Remains, page 62.....	...	...	...	...	...
1. SAGENIS, Owen, Report Iowa, Wis. and Min. tab. vii. fig. 3.....	...	...	...	...	...
1. NEBRASCENSIS, Owen, " " " " tab. viii. fig. 1.....	...	...	...	...	...
1. SUBLEVUS, Hall & Meek, Mem. Am. Ac. Art. & Sci. Bost., v. 5, N. S. p. 386	...	...	...	...	...
1. CONVEXUS, Hall & Meek, " " " " "	...	...	...	...	...
1. TENUILINEATUS, Hall & Meek, " " " " 387	...	...	...	...	...
1. CONRADI, Hall & Meek, " " " " "	...	...	...	...	...
1. FRAGILE, Hall & Meek, " " " " 388	...	...	...	...	...
1. VENTRICOSUS, Meek & Hayden, Proc. Ac. Nat. Sc. Phila., vol. 8, p. 87.....	...	...	...	...	...
1. PECTENUS, Meek & Hayden, (accompanying paper).....	...	...	...	...	...
1. INCURVUS, Meek & Hayden, " " " " "	...	...	...	...	...

Gen. PECTEN.

P. RIGIDA, Hall & Meek, Mem. Am. Ac. Arts & Sci. Bost., vol. 5, N. S. p. 381	...	...	...	...	...
P. NEBRASCENSIS, Meek & Hayden, Proc. Acad. Nat. Sc. Phila., vol. 8, p. 87	...	...	...	...	...

* Is Prof. Tuomey's *I. bifurcus*, Proc. Ac. N. S. Philada., vol. 7, p. 170, identical with this?

	Formations in ascending order.				
	1	2	3	4	5
Gen. OSTREA.					
O. CONGESTA, Conrad, Nicollet's Report.....	*		
§8(?) O. LARVA, Lamk., Hist. vol. 216.....		*	*
O. PATINA, Meek & Hayden, (accompanying paper).....		*	
Gen. CAPRINELLA.					
C. CORALOIDEA, Hall & Meek, Mem. Ac. Arts & Sci. Bost., v. 5, N. S. p. 380.....		*	
Gen. LINGULA.					
L. SUBSPATULATA, Hall & Meek, Mem. Ac. Arts & Sci. Bost., v. 5, N. S. p. 380.....		*	
In addition to the foregoing list of determined species, we have seen amongst the Nebraska fossils the following miscellaneous fragments:—					
One elytron of an undt. insect?.....			*
Fragments of undt. <i>Baculite</i>	*		
" " " species <i>Reticulipora</i> , (very rare).....			*
One fragment of undt. <i>Echinoid</i>			*
Fragments of small slender coral—gen. undt.....			*
" " " discoid " " ".....			*

Birds of South-eastern Indiana.

By RUFUS HAYMOND, M. D.

Genus HALLÆTUS, Sav.

HALLÆTUS LEUCOCEPHALUS, Linn.—The Bald Eagle.

A few of these noble birds still linger in this section of the country. I have observed one or two of them each winter for the last twenty-five years. They are rarely seen at any other season of the year.

Genus PANDION, Sav.

PANDION HALLÆTUS, Linn.—Osprey, or Fish Hawk.

Common during spring and autumn, but more abundant during the latter season.

PANDION WASHINGTONII.—Bird of Washington.

Falco Washingtonii, Aud.

This bird has been observed on white Water River by some of our older citizens, every fall and winter for more than forty years. I have myself observed one or more of them almost every winter for more than twenty years. Their habits being almost identical with those of the Osprey, I have placed them, without any other authority, in the same genus.

Genus FALCO, Linn.

FALCO PALUMBARIUS.—Goshawk.

These hawks are quite numerous in all the wooded districts of the western country.

FALCO COLUMARIUS, WIL.—The Pigeon Hawk.

I have occasionally seen a few of these hawks following the flight of pigeons in their migrations. I have no recollection of ever having seen them, except when these birds were very abundant.

FALCO SPARVERIUS.—The Sparrow Hawk.

This beautiful little falcon is quite numerous.

FALCO FUSCUS.—Long-tailed Hawk.

Probably the most numerous of all the hawks in this section of the country.

FALCO FURCATUS.—The Swallow-tailed Kite.

I have never seen but a single specimen of this Kite, which was shot eleven miles below Brookville. It had been feeding upon beetles and the eggs of the cat bird, (*Mimus lividus*), which it had swallowed without breaking.

Genus BUBO, Sibbald.**BUBO VIRGINIANUS.—The Great Horned Owl.**

This powerful species is rather numerous, probably as much so as any other owl.

Genus EPHIALTES.**EPHIALTES ASIO, Linn.—Screech Owl.**

This little owl is quite common.

Genus SYRNIUM, Savigny.**SYRNIUM NEBULOSUM.—The Barred Owl.**

Quite numerous in all the timbered country, though by no means so numerous as they formerly were.

Genus CATHARTES, Linn.**CATHARTES AURA.—The Turkey Buzzard.**

Numerous throughout the country at all seasons of the year. This is the only vulture I have ever observed in this section of country.

Genus CAPRIMULGUS, Linn.**CAPRIMULGUS VOCIFERUS, Wilson.—Whip-poor-will.**

These noisy birds are very numerous all over the country.

CAPRIMULGUS VIRGINIANUS.—Night Hawk.

Quite a number of these birds appear here in May, and after remaining two or three weeks, disappear, and return in largely increased quantities during the month of September.

Genus HIRUNDO, Linn.**HIRUNDO PELAGICA.—The Chimney Bird.**

The most numerous of all the swallows. They are the last to arrive in the spring, but remain from four to six weeks longer than any other species.

HIRUNDO LUNIFRONS.—Republican or Social Swallow.

Hirundo lunifrons, Say.

Hirundo opifex, Clinton.

This species has been quite numerous since the summer of 1849, when, for the first time, they built their nests in this (Franklin) County. Prior to that time I had occasionally seen them passing through the country; they are now the most numerous of all the swallows, except the chimney bird.

HIRUNDO RUFA.—The Barn Swallow.

These swallows are quite numerous, and rank in this respect next to the gourd swallow.

HIRUNDO RIPARIA.—Bank Swallow.

Numerous along all the streams with abrupt sandy shores; next in numerical strength to the barn swallow.

HIRUNDO PURPURA.—The Martin.

Quite common, but not so numerous as the sand martin.

HIRUNDO BICOLOR.—White-bellied Swallow.

Last May (1856) I shot one of these birds, which is the only one of the kind I have ever seen, or the only one I have recognized as certainly belonging to that species.

Genus **ALCEDO**, Linn.**ALCEDO ALYON**, Aud.—The Belted King Fisher.

This king fisher is quite numerous along all our streams at all seasons of the year. It is the only king fisher we have.

Genus **MELLISUGA**, Briss.**MELLISUGA COLUMBIS**, Linn.—Ruby-throated Humming Bird.

Very abundant throughout the whole State. We have no other humming bird.

Genus **CERTHIA**, Linn.**CERTHIA FAMILIARIS**, Linn.—Brown Tree-creeper.

Occasionally seen, though not numerous.

CERTHIA VARIA.—Black and White Creeper.

Very numerous.

Genus **SITTA**, Linn.**SITTA CAROLINENSIS**, Lath.—The Nut Hatch.

This familiar bird is very numerous, and known to all our citizens by the name of "Tom-tit."

Genus **TROGLODYTES**, Vieillot.**TROGLODYTES AEDON**, Vieill.—The House Wren.

This wren is quite numerous in this country; it, however, rarely builds its nest about houses, but usually in the hollows of trees and logs.

Genus **SYLVIA**.**SYLVIA TROGLODYTES**, Aud.—Winter Wren.

Frequently seen in fall and winter, but seldom or never at any other season.

Genus **TURDUS**, Linn.**TURDUS RUFUS.**—Ferruginous Mocking Thrush.

This is a very common bird, and the best imitator of the whole family, except the mocking bird.

TURDUS MIGRATORIUS, Linn.—The Robin.

This is much the most numerous of all the Thrushes, at all seasons of the year; more numerous, however, in fall and winter than at any other period. About six years ago they collected in vast multitudes about twenty miles south-east of this place, (Brookville,) roosting on the trees together as the pigeons

are in the habit of doing. Many thousands of them were killed by ruthless "pot-hunters."

TURDUS MUSTELINUS, Gmel.—The Wood Thrush.

Numerous all over the wooded districts of the Western country. The male and female sit by turns upon the eggs during the period of incubation. Of all the thrushes, its notes, though not so varied as some of the others, are the most beautiful, clear and full—varying from those of the flute, through many tones impossible to describe, ending with a kind of metallic vibratory sound, which, to be understood, must be heard.

TURDUS POLYGLOTTUS, Wil.—The Mocking Bird.

This celebrated songster, occasionally, though seldom, stays this far north. I have seen a few and heard the notes of a few others here within the last thirty years.

TURDUS LIVIDUS, Linn.—The Cat Bird.

This is a very common species all over the West. I have seen them in numbers as far north as St. Paul, in Minnesota, in the month of October.

TURDUS AQUATICUS, Wil.—Water Thrush.

This little thrush is very numerous in the vicinity of all our streams.

TURDUS SOLITARIUS, Wil. ?—Hermit Thrush.

The bird to which I apply this name is so similar in appearance to the wood thrush, that for a long time I confounded the two; and I am by no means certain that I am correct in applying to it the name of Hermit Thrush.

Genus TYRANNUS, Cuv.

TYRANNUS INTREPIDUS, Vieill.—The King Bird.

Numerous, and the last of the summer birds reaching this section. They are said to eat bees, and probably do, but I have never been able to find any in the stomachs of those I have killed and examined.

Genus TYRANNULA, Swains.

TYRANNULA CRINITA, Linn.—Great Crested Fly-catcher.

Very common here, and all over the West.

TYRANNULA FUNICULA.—Pewee.

Numerous, and the first of the migratory birds to make its appearance in the spring, usually arriving about the first of March.

TYRANNULA VIRENS, Linn.—Wood Pewee.

Probably more numerous than the common Pewee.

TYRANNULA TRAILLI, Aud.—Traill's Fly-catcher.

I have never seen but a few of these birds.

Genus SETOPHAGA, Swains.

SETOPHAGA RUTICILLA, Gmel.—American Redstart.

This beautiful bird may be seen almost any day in deep woods during the months of May and June.

Genus CULICIVORA, Swains.

CULICIVORA CERULEA.—Blue Gray Gnat-catcher.

The most numerous of all the fly catching tribe.

Genus STERNA.

STERNA DOUGALLII.—The Roseate Tern.

I do not recollect to have seen but a single individual of this species.

STERNA ARCTICA.—Black-capped Tern.

I have seen several flocks of these birds, generally in the month of June, during freshets and storms.

Genus LARUS.

LARUS LEUCOPTERUS, Aud. (?)—White-winged Gull.

Very common along the river during the winter. Besides this, there are several other species of Gull occasionally seen passing through the country.

On a new and remarkable genus of Ranidae, from the river Parana.

By EDW. HALLOWELL, M. D.

Gen. TRIGONOPHRYS.

Char. Head very large, depressed; upper eyelid triangular; tongue large, subcircular, notched in front and posteriorly, more deeply behind, attached in front, free laterally and in its posterior half; upper maxillary teeth large, conical, recurved, sharp-pointed; two groups of vomerine teeth on a line with the anterior margin of the posterior nares, nearer to them than to each other; posterior nares large, subcircular; eustachian foramina of moderate size, rather large; no vocal vesicles either internal or external; tympanum indistinct; four fingers completely free; toes palmate at their base only; first cuneiform bone presenting a prominence externally, with a well defined projecting edge; transverse processes of the sacral vertebrae not dilated.

TRIGONOPHRYS RUGICEPS, nob.

Char. Body thick and stout, more or less covered with tubercles above; two movable bucklers beneath the skin, posterior to the occiput; two glands upon the upper surface of each thigh near the groin; two others larger upon the breast; ground color of body and sides olive, presenting numerous dark colored, ovoid spots, with a narrow margin of white, the interspaces in the immature specimens of a beautiful rose color; extremities olive, with large and broad bands of black margined with white, the interspaces more or less tinged with red; under parts white mingled with yellow; chin and throat black spotted.

Dimensions. Length of head 1 inch 4 lines; greatest breadth 2 inches $3\frac{1}{2}$ lines; breadth of bucklers 1 inch $7\frac{1}{2}$ lines; length of body 3 inches; breadth 3 inches 2 lines; length of anterior extremities $2\frac{1}{2}$ inches; of posterior extremities 4 inches.

Gen. Remarks. A more detailed description with drawings, and an account of the anatomy, will be given in the next volume of the Journal. It differs from Ceratophrys, to which it is closely allied, in the shape of the eyelids, the form of the body, the structure of the skull, and the teeth, which are remarkable for their great development.

ELECTION.

Mr. Frederick G. Hesse, of Washington, and Drs. Geo. J. Ziegler and John H. Packard, of Philadelphia, were elected Members; and Philip Lutley Selater, M. A., of London, and the Right Revd. Stephen Elliott, Bishop of Georgia, were elected Correspondents of the Academy.

December 2d, 1856.

DR. BRIDGES, Vice President, in the Chair.

Letters were read—

From P. L. Solater, dated Philadelphia, Nov. 30th, 1856, acknowledging his election as a Correspondent of the Academy.

From Dr. W. A. Hammond, dated Fort Riley, Kansas Territory, Nov. 11th, 1856, transmitting donations to the Museum.

Dr. Leidy announced that the skin of the Walrus, presented by S. Drinker, Esq., of Hong Kong, China, had been mounted and placed in the Museum.

Mr. Vaux, on behalf of the Publication Committee, announced the publication on the 18th November, of part 3, vol. iii. of the Journal of the Academy.

On leave granted, Dr. Le Conte offered the following resolutions, which were adopted :—

Resolved, That Messrs. Trübner & Co., of London, be appointed agents in Europe for the publications of the Academy.

Resolved, That the Committee on Proceedings be directed to prepare a circular, to be directed to the Members and Correspondents of the Academy, soliciting subscriptions to its publications.

Resolved, That the Committee on Proceedings be directed to consider the expediency of raising the price of the printed Proceedings of the Academy, and to report at the next meeting for business.

December 9th.

DR. BRIDGES, Vice President, in the Chair.

Letters were read—

From the Royal Society of Sciences of Upsal, dated Nov. 16th, 1855; from the Imperial Royal Geological Institute of Vienna, dated March 20th, 1856; and from the Zoologico-Botanical Society of Vienna, dated May 10th, 1856, severally transmitting donations to the Library.

From E. J. Lowe, dated Highfield House Observatory, Nov. 18th, 1856, transmitting a copy of his Natural History of Ferns.

From the Imperial Academy of Sciences of Vienna, dated April 15th, 1856, acknowledging the receipt of the Journal of the Academy, and desiring certain back numbers. Referred to the Publication Committee.

Dr. Leidy presented for publication in the Proceedings, a paper entitled, "Remarks on certain extinct species of Fishes. By Joseph Leidy, M. D.;" which was referred to a Committee consisting of Mr. Lea, Mr. Lesley and Dr. Le Conte.

Mr. Lea read a letter from Dr. McChesney, of Quincy, Illinois, accompanying a box of Naiades, acknowledged this evening.

Mr. Lesley made some remarks upon a Hæmatitic geode, found near Marietta, Pa., which was filled with pure drinkable water instead of the usual clayey matter; he also alluded to another, which was filled with a cubical crystal of galena.

December 16th.

MR. LEA, Vice President, in the Chair.

Letters were read—

From Prof. J. P. Kirtland, dated Cleveland, Ohio, Nov. 24th, 1856, transmitting a specimen of Bohemian Waxwing, (*Bombycilla garrula*,) from that neighborhood.

From the Dublin University Zoological and Botanical Association, dated Trinity College, Dublin, Nov. 28th, stating that their printed Transactions had been transmitted to the Academy, and desiring exchanges. Referred to the Publication Committee.

The following papers were presented for publication in the Proceedings:—

"Classification of the Vegetable Kingdom. By T. G. Hilgard, M. D.;" referred to a Committee consisting of Mr. Durand, Dr. Uhler and Dr. Rand.

"Notice of remains of extinct Turtles from New Jersey, &c. By Joseph Leidy, M. D.;" referred to a Committee consisting of Dr. Le Conte, Mr. A. H. Smith and Mr. Ashmead.

Mr. Cassin read a letter from Mr. P. B. Du Chaillu, dated Corrisco, Gaboon, Oct. 15th, 1856, transmitting a large and valuable collection of objects in Natural History, and giving an interesting account of his explorations. On motion of Dr. Le Conte, Mr. Cassin was requested to prepare an abstract of the letter for publication in the Proceedings.

Mr. Lea mentioned that, in describing a new species of *Triquetra*, Klein. (*Hyria*, Lam.) in April last, (Proceedings, vol. viii. p. 79,) he had but a single valve, which had the appearance (as stated in his remarks not yet published) of being twisted like *Arca tortuosa*, Lin. This extraordinary form, which had never been suspected to exist in any member of the family *Naiades*, excited great interest with the zoologists who saw it; but it was still a matter of doubt whether the curve, although exceedingly regular and presenting no appearance of constraint or injury, might not be abnormal. This doubt has now, however, been put entirely at rest, for the curve of both specimens is so precisely the same, that when the odd right valve is placed against the left of the other, they fit perfectly, proving that the curve is a mathematical law belonging to the species. He exhibited to the Society a complete adult specimen, which H. Cuming, Esq., of London, sent him for inspection and to be figured. The species was recognized by Mr. Cuming on his visit here recently at once to be the same as that in his cabinet, and he promptly and liberally offered to place this unique specimen in Mr. Lea's hands for a more perfect description and figure than could be given of the single immature valve he already had. Mr. Cuming's specimen is quite six inches along the dorsal line to the angle of the posterior margin, and this line deflects quite two inches in the course of the six inches from a straight line, and it is so twisted that the basal margin at the posterior end turns up to be on a plane with the dorsal line at the beaks. This remarkable curve causes the long lateral teeth to have a curve of double curvature. The greatest distance from the dorsal to the basal margin is one inch and three-tenths. The greatest diameter is nine-tenths of an inch, which gives it a sub-cylindrical form, and it is not unlike a twisted banana, (*Musa sapientum*). This perfect specimen presents the superior portion of the valves covered with small, regular tubercles, which was not suspected in the original single valve, there being on it only a few irregular undulate markings. Mr. Cuming's specimen settles the doubt as to habitat. He received his from Shanghai, and therefore Mr. Fitch and Dr. Ingalls, to whom I

owe the possession of the single valve, were right in assigning it to China. Doubts arose from the fact that, heretofore, *Trigueta* has been considered to be confined to South America. Mr. Lea stated that he proposed the name should be changed from that he originally proposed, (*T. lanceolata*, as inappropriate to the complete mature shell,) to that of *contorta*, which is very descriptive, and can never be mistaken.

December 28d.

DR. BRIDGES, Vice President, in the Chair.

A letter was read from the Society of Arts, Manufactures and Commerce, dated Adelphi, London, Nov. 22d, 1856, acknowledging the receipt of the Proceedings of the Academy.

The following papers were presented for publication in the Proceedings of the Academy:—

"Note on the collection of Reptiles from Texas, recently presented to the Academy of Natural Sciences of Philadelphia by Dr. A. Heermann. By Edward Hallowell, M. D." "Description of a new genus of Colubriiform Serpents from California. By Edward Hallowell, M. D.;" both referred to a Committee consisting of Mr. Haldeman, Dr. Le Conte and Dr. Morris.

"Notices of extinct Vertebrata discovered by Dr. F. V. Hayden, &c. By Joseph Leidy, M. D.;" referred to a Committee consisting of Dr. Le Conte, Mr. Haldeman and Dr. Wilson.

"Catalogue of Birds collected at Cape Lopez, Western Africa, by Mr. P. B. Du Chaillu, in 1856, with notes and descriptions of new species. By John Cassin;" referred to Drs. Woodhouse, Wilson and Bridges.

"Description of three new genera, twenty-three new species of Tertiary fossils from California, and one species from Texas. By T. A. Conrad;" referred to Dr. Wilson, Dr. Leidy and Mr. A. H. Smith.

Dr. Morris mentioned an instance of a tumor taken from the abdomen of a cat, which, upon examination, proved to be true medullary cancer.

December 30th.

DR. BRIDGES, Vice President, in the Chair.

The Committees to which were referred Drs. Leidy's and Hilgard's papers, read 16th inst.; and Drs. Hallowell's and Leidy's, and Messrs. Cassin's and Conrad's papers, read 23d inst., severally reported in favor of publication in the Proceedings.

Remarks on certain extinct species of Fishes.

By JOSEPH LEIDY, M. D.

Remarks on Edestus corax, Journ. A. N. S. iii. 159.—Since describing the fossil, supposed to be the fragment of an upper jaw of a fish, to which the name of *Edestus corax* was given, it has occurred to me that it may perhaps be the portion of a dorsal spine of a huge cartilaginous fish. In the published Proceedings of the American Association for the Advancement of Science, (Providence,

229.) Prof. Hitchcock has given a notice, together with a wood cut, of a fossil from the coal formation of Indiana, which bears a striking resemblance in form to the fragment of *Edestus vorax*. The form of the teeth and their relative position to one another and the bone are the same in both fossils. The bone in the wood cut is not represented as being segmented, but if it is so, and the teeth are coosified with the segments, then the specimen actually indicates a second species of *Edestus*. Prof. Hall informed me, that when he saw the original of the fossil just noticed, that it appeared to him to be an ichthyodondulite.

From the remarks of Prof. Agassiz, appended to Prof. Hitchcock's notice, he regards the latter specimen as "a part of the jaw of a shark allied to the saw fish, or *Pristis* family." Not having seen the original specimen, I am unwilling to consider it as belonging to a member of the peculiar family *Edestina*, of which *Edestus vorax* is the type, but if it does so, it will be widely separated from the *Pristis* family, in which the teeth are inserted into imperfect sockets, and the jaw exhibits no trace of segmentation.

Remarks on Cyliodracanthus ornatus, Proc. A. N. S. viii. 12.—The fossil fragments of long, conical bones, which I supposed to be portions of the dorsal spine of a fish, Prof. Agassiz informs me he considers to be the snout of a peculiar genus of sword fishes, which he has incidentally mentioned in the Poissons Fossiles, (t. v. p. 92,) under the name of *Ooelohynchus*. The correctness of this view I do not hesitate to admit, and it appears to receive confirmation by the inspection of a figure (plate xi. fig. 26) which I have since observed in Dixon's Geology of Sussex, representing the snout with its free extremity perfect.

Remarks on Saurocephalus and its allies.—This is the title of a paper recently presented to the American Philosophical Society. The genus *Saurocephalus* was founded by Dr. Harlan on a fragment of an upper maxillary bone with teeth, of a peculiar genus of sphyrenoid fishes, from the cretaceous formation of the Upper Missouri. A second species, under the generic name of *Saurodon* was subsequently described by Dr. Hays from a specimen consisting of the upper and lower jaws, from the cretaceous formation of New Jersey. Prof. Agassiz afterwards described the remains of several sphyrenoid fishes from the chalk of England, which he has erroneously attributed to the genera *Saurocephalus* of Harlan and *Saurodon* of Hays. Dixon, and other authors following Agassiz, have described remains of fishes from the chalk of Europe, and have entirely lost sight of the true *Saurocephalus*. The various remains attributed to the latter appear to be separable into the following species.

1. SAUROCEPHALUS LANCIFORMIS, Harlan: Jour. A. N. S. iii. 337; Med. and Phys. Res. 362; *Saurodon lanciformis* Hays: Trans. Am. Phil. Soc. iii. 476.
2. SAUROCEPHALUS LEANUS, Harlan: Med. and Phys. Res. 362; *Saurodon Leanus*, Hays: Tr. Am. Ph. Soc. iii. 477.
3. PROTOPHYRÆNA FEROX, Leidy. *Saurocephalus lanciformis*, Harlan, Agassiz: Pois. Fos. v. 102, pl. 25c, figs. 21—29; Dixon: Geol. Sussex 374, pl. xxx. fig. 21, xxxi. fig. 12, xxxiv. fig. 11; Pietet: Traité d'Pal. pl. xxxii. fig. 7; Giebel: Odont. pl. xliii. fig. 7, &c.
4. PROTOPHYRÆNA STRIATA, Leidy. *Saurocephalus striatus*, Agassiz: Pois. Fos. v. 102, pl. 25c, figs. 17—20; Dixon: Geol. Sussex 375, pl. xxxv. fig. 5.
5. CIMOLICHTHYS LEVESIENSIS, Leidy. *Saurodon Leanus*, Hays, Agassiz: Pois. Fos. v. 102, pl. 25c, figs. 30, 31; Dixon, Geol. Sussex 373, pl. xxx. figs. 28, 29; xxxiii.* fig. 10, &c.
6. XIPHIAS DIXONI, Leidy. *Saurocephalus lanciformis*, Harlan, Dixon: Geol. Sussex, in note to p. 375, pl. xxxii.* fig. 1.

Notices of Remains of Extinct Turtles of New Jersey, collected by Prof. Cook, of the State Geological Survey, under the direction of Dr. W. Kitchell.

By JOSEPH LEIDY, M. D.

1. *CHELONE GRANDÆVA*, Leidy, Proc. Acad. Nat. Sci. v. 329.

Originally founded on three vertebral plates from the Miocene marl of Salem co., N. J. The collection of the N. J. State Geological Survey contains several costal plates broken into numerous fragments, three anterior marginal plates, and a hyosternal plate also broken into many fragments. A median costal plate restored, measures $8\frac{1}{2}$ in. long to the projecting portion of the rib, which is lost, $3\frac{1}{2}$ in. wide and $\frac{1}{2}$ in. thick. The marginal plates, convex above and at the outer border, and acute within, are $4\frac{1}{2}$ in. long, $2\frac{1}{2}$ wide and 1 in. thick. The broken hyosternal preserves its length, which is 10 in. from the anterior point to the posterior suture. One of the vertebral plates above mentioned, is $2\frac{1}{2}$ in. wide, $2\frac{1}{2}$ in. antero-posteriorly and $\frac{1}{2}$ an inch thick.

The surfaces of all the bones are smooth. The estimated length of the carapace is about 35 to 40 inches, the breadth about 30 inches.

The same collection contains fragments of several lateral and posterior marginal plates of a marine turtle, about the size of that just indicated, but the specimens were obtained from the cretaceous Green Sand formation of Monmouth co. N. J. The specimens have a thick grooved inner border, and gradually become thinner until they terminate in an acute outer border. They are slightly curved upwardly, and their surfaces are smooth. One of the plates has an entire length of $3\frac{1}{2}$ inches; and is $3\frac{1}{2}$ inches broad by $\frac{3}{4}$ of an inch thick at the inner border. Another plate is $4\frac{1}{2}$ in. long, $2\frac{1}{2}$ in. wide and $\frac{3}{4}$ of an in. thick internally.

2. *EMYS VERNUS*, Leidy.

In company with the latter were found the third, sixth and seventh marginal plates of the left side; the sixth, seventh and eighth of the right side, and portions of the left hyosternal and the right hyposternal plates of a species of *Emys*.

The surfaces of the bones are nearly smooth, and those of the sternum are of great thickness. The seventh marginal plate from its upper border to its acute edge measures $3\frac{1}{2}$ in., and transversely $2\frac{1}{2}$ in. The two sternal plates in the median line are each about 3 in. long, and in the same position are from 7 lines to 1 inch in thickness.

3. *EMYS PRÆVUS*, Leidy.

Found with the remains of the preceding species, there are the greater portions of a right hyosternal and a left hyposternal plate of a second species. Surfaces without distinct marks of the scutes, and presenting an eroded appearance. Median suture irregular in its course; and that between the hyo- and the hyposternals is even more irregular. Length of each plate in the median suture $5\frac{1}{2}$ inches; thickness from 5 lines to half an inch. Breadth of ento-sternal space $2\frac{1}{2}$ inches.

4. *PLATEMYS SULCATUS*, Leidy.

Specimens of the fifth, sixth and seventh left marginal plates found with the preceding remains of *Emys*; apparently indicate a species of the subgenus *Platemys*. The three bones together measure along their acute margin 8 inches. The seventh plate is 3 inches antero-posteriorly and $2\frac{1}{2}$ high.

The surface of the plates is marked with tortuous grooves.

5. *CHELONE ORNATA*, Leidy.

The collection of this Academy contains portions of two lateral marginal plates of a marine turtle from the green sand of Burlington co., N. J., where they were discovered by Mr. L. T. Germain. The bones are wedged-shaped in trans-

verse section, grooved at the inner border, acute at the outer border, and measure $1\frac{1}{2}$ inches broad. The upper and under surfaces are coarsely but beautifully tuberculated.

Synopsis of a new Classification of the Vegetable Kingdom.

By THEODORE C. HILGARD, M. D.

We lay before the public the result of our observations on the *natural connections* among vegetable forms (relationship), demonstrating them to form a *single file of transitions* or total resemblances, from the first to the last; and furthermore, showing what can be claimed as absolute relations and what as accidental relation or *parallelism*; which parallelisms, if repeated, form laws of rhythmic approximation or collateral relationship; and under any consideration furnishing, we believe, a *consistent base for consistent researches on the laws of progressive vegetable development*, and, it may be, organic development generally. At present, occupied with a complete *exposé* and qualification of this scheme, we would be happy beforehand to draw the attention and efforts of botanists, placed mostly under more favorable circumstances than ourselves, to the high importance of this question generally, and to thus solicit their own ideas, observations and communications *on their own grounds*, by which, doubtless, much prolific material might be prepared, elicited and collected.

In the present scheme, we have noted our principal suggestions of relations hitherto not generally adopted or even known before, by *, by which we mean to imply a very close relationship. If thus a member is introduced among a group of families of acknowledged general affinity, it will of course be found enclosed between two stars; for a mere serialization, according to our views, of families notoriously related, we give no express mark, leaving it to the interest of the reader to compare with their various previous serializations.

SERIEI VEGETABILIS PRODROMUS.

CYTEMBRYONEÆ.

seu sporiferæ.

FUNGI: Fermenta,* Mucedines,* Favi,* Uredines, Spumariæ, Lycoperdæ, Phallæ,* Morchellæ, Agaricæ, Tremellæ, Pezizæ, Clavariæ, Actidiæ, (sub epidermide corticum nidulantes).

LICHENES: (Sub epidermide corticum nidulantes,) Graphidinae, Pertusariæ, Lecidiæ,* Parmelinæ, Stictæ, Uscinæ,* Cladoniæ, Bæomyceæ, (thallo amy-laceo in humo diffuso, sporophoriis fungoideis).

ALGÆ: * (Thallo leprodeio in humi superficie quasi efflorescente, sporangiis gelatinosis scutatis—Ochlerococcus s. Protococcus s. Lepraria kermesina s. Favilla variegata, mihi) Favillæ,* fronde gelatinoso diffuente, Nostochinae, Conserveæ, Diatomæ, Hydrocytionæ, fronde gelatinoso-cartilagineo vel indurato: Anthophyceæ, Sorophyceæ, Cytidophyceæ*, Batrachospermæ,* Characæ: *

MUSCI: (Sphagnum) Bryoidæ, Jungermannieæ, Marchantiæ (sporophoriis stipitatis radiatis solitariis).*

FILICES: (Sporophoriis stipitatis radiatis in spicam congestis) Equisetacæ,* Lycopodiaceæ, Ophioglossæ, Hymenophyllæ, Osmundæ, Polypodiæ, Cyathaceæ, Marattieæ, Marsileæ, Salviniæ, (sporis heteromorphis, masculis pollen sistentibus, fœmineis ovulis pollen recipientibus).*

PHYLLEMBRYONEÆ.

seu seminiferæ.

I. MONOCOTYLEDONÆ.

a medullares:

LORICATÆ: (s. phyllodicæ), utriculis styliferis monospermis phyllodiis sub-

immersis: Lemnaceæ,* Balanophoreæ, Rafflesiaceæ,* Cycadæ, Cupressinæ, Aletineæ, Taxinæ, Gnetales,* (Chloranthaceæ ?)

β vasculares :

LIRIA: (Rusens ?) Asparagæ, Smilacæ, (epigyn.) Dioscoreæ (hypogyn.) Roxburghiaceæ,* Paridæ,* (Uvularia) Melanthaceæ,* Curculigæ,* Calceatiasæ,* Phormiæ, Agavæ, Aloinæ, Agapanthæ, Allieæ, Asphodeleæ, Liliæ,* (Lilium.

SOTTAMINORÆ: (epigyn.) Alstræmeria) Amaryllæ, Iridæ,* Pontederæ,* Can-nacæ, Zingiberacæ, Musacæ, Orchidæ, Apostasiæ, Bromeliacæ, Hæmedo-racæ,* Hypoxidæ,* (Asteliæ ?*)

GRAMINÆ: Luzullæ, Xyridæ, Commelynacæ,* Centrolepidæ, (Philydræ ?) Graminæ, Cyperacæ.*

SPADICES: Typhacæ, Aceroidæ, Aroidæ, Pandanæ, Palmæ.*

II. DICOTYLEDONÆ.

LAURIGERÆ: Piperitæ,* Saururus,* Najadæ (exogenæ !), Alismacæ* (Echi-nodorus,* Ran. missour.) Ranunculacæ, Berberidæ,* (Menispermæ ?),* Laurinæ, Monimiaceæ (affin. c. Calycanthol),* Proteacæ, Eleagnæ, Daphnoidæ, Aquilariæ,* Serpentariæ,* Calycanthæ,* Illiciæ, Magnoliæ, Anonæ, Myrsi-niæ.*

NELUMBIA: Cabombæ, Nelumbiæ, (hypo-et epigyn.) Nymphaeacæ* (exo-genæ !), Hydrocharidæ,* (Burmaniæcæ ?),* Begoniæcæ.*

GRUCIALES: Umbellifær, Araliacæ, (hypogyn.) Cissæ (magn. c. Begon. affinit.), Violacæ, Sarracenicæ,* Nepenthes,* Droseracæ, Parnassiæ,* Roso-dacæ (*?), Oxalidæ (maxim. c. Viol. affin.), (perigyn.) Geraniacæ, Tropæola-cæ, (hypogyn.) Balsaminæ (Bals. et Fum.: calyce tetramero [2×2] calcarato; petalis quatuor unguiculatis, per paria lateraliter [in Fum. quatuor petala et apice] connatis !)

RUCIADÆ:* Fumariacæ, Papaveracæ, (Isatis) Crucifær, Capparidæ, (epigyn., max. c. Glaucio affin.) Bartonieæ (Loasacæ), (Turneracæ, Bixacæ, Samy-dæ ?)

PERONES: (perigyn.) Homalinæ, Passifloræ, (epigyn.) Papayacæ, Cucurbi-tacæ, Nandirobæ,* Columelliæcæ,* Stylidæ, Lobeliæcæ, Campanulinæ, (Trachelium,* Contranthus) Valerianæ.

CUPULIFERÆ: Dipsacæ, synantheræ: Mutisiacæ,* Calceolæ,* (Zacyntha!) Cichoracæ (Scolymus,* Carthamus) Cynareæ (Echinopidæ,* Elephantopæ) Vernoniæcæ,* Ethulia,* (Ageratum) Eupatoriæ (Steevia,* Bigelovia) Asteræ, (Pulicariæ) Inuleæ, (Tassilago) Tassilaginéæ (Adenostyleæ,* Cacalia) Senecio-cæ (Cineraria,* Cryptostemma, Matata etc.) Anthemidæ (Artemisia,* Filago) Gnaphaliæ,* Partheniæ, Silphiæ,* Ecliptæ, Dahliæ, Calliopseæ (Bidens,* Sauvitalia), Rudbeckiæ (Obeliæcæ,* Leptopoda), Heleniæ, (Actinomeris) Helianthæ (Gymnosps),* Melampodiæ,* eleutherantheræ: Calyceræ, (apetal.) Ambrosiæcæ, cannabineæ: Thelygonum, Cannabineæ,* Datisca,* amen-tacæ: Juglandæ, Corylus!* Myrica!* Quercus, Fagus Carpinus etc. Betulinæ.

CRUSTIFERÆ: (hypogyn.) Populinæ,* (petalif.) Tamariscinæ, Reaumuriæcæ,* Hypericiné!* Linæ,* Armeria, Statice,* (apetal.) Nyctaginæ,* (petalif.) Frankeniæcæ,* (apet.) Scleranthæ, (petalif.) Dianthæ, Alsineæ (Polycarpon), (apetal.) Molluginæ,* Paronychiæ!*

FICOIDÆ:* oleracæ: Polygonæ, Amarantacæ, Chenopodæ, casuarinæ: Salicorniæ,* Podostemæ, Callitrichiæ,* Batis,* Ceratophyllæ, Myriophyl-læ,* Casuarinæ!* urticacæ: Platanæ, Artocarpæ, Moreæ, Urticacæ, Ficinæ, Euphorbiæcæ.*

LIMBOLÆ: (petalif.) (epigyn.) Stackhousiæcæ,* (hypogyn.) Strychnæ, Lo-

ganaceæ, (Antonia,* Syringa) Ligustrinæ,* Gentianæ (Ohlora,* Nyctanthes) Jasminæ, (Nolana? Oordiaceæ?), Bolivareæ, Apocynæ, Asclepiadæ, (Erycibe,* Ouscuta?), Convolvulacæ,* Cobsea,* Petunien,* Goodeniaceæ,* Plumbago,* (Phlox) Polemoniaceæ, Hydrophyllæ (Phacelia,* nukuliferæ: Heliotropium) Borraginæ.

PERSONATÆ: (Ajuga) Labiatæ (Lavandula,* Vitex) Verbenacæ (Verbena stricta, bracteosa!), capsulares: Plantaginæ,* Globularia, Selaginæ, Stilbinæ, Rhinanthacæ,* Orobanchæ,* Cytinæ,* (compar. Russeggera etc.) Acanthacæ (Ruellia,* Trevirana) Gesneriaceæ (Columnæ,* Stenochilus etc.) Myoporinæ, (Duboisia myoporoides,*) Salpiglossæ, Scrophulariæ, (Paulownia), Bignoniaceæ, (Eccremocarpus,* Martynia) Pedalinæ (Josephinia,* Datura) Solanæ, Primulacæ (incl. Lentibulariæ.)

OLIVARES: Myrsinæ, Sapotæ, Ebenacæ (Royena,* Unedo) Rhododendræ (Kalmia,* Epacris impressa) Epacridæ, (Fabiana) Ericacæ, (epigyn.) Vacciniæ, (apetal.) Loranthacæ,* Santalacæ,* (perigyn,*) (Phyllicæ,) Rhamnæ, Celastrinæ,* Hamamelidæ,* Pittosporæ,* Hippocrateacæ,* Aquifoliacæ,* (Nitriariæ, Putranjivæ?),* Empetræ,* (Celtis, Ulmus, Fraxinæ?,)* Oleacæ,* (epigyn.) Nyssa,* Cornæ,* Styracæ,* Rubiacæ, Lonicæ.*

TIARATÆ: (Viburnum,* Hydrangea) Hydrangæ, Escallonien,* Dilleniacæ,* Cunoniaceæ, Crassulacæ, Saxifragæ, Ribesiaceæ,* (Fuchsia) Onagraræ (Lopezia),* Melastomæ, Cupheacæ, Lagerstromiæ,* Punicæ, Myrtacæ,* Trapa,* Rhizophoræ, Combretacæ, Cactæ, Mesembryanthemum, (subhypogyn.) Portulacacæ.*

COLUMNIFERÆ: (hypogyn.) Cistinæ,* Tiliacæ, Byttneriacæ, Sterculiacæ, Malvacæ, Gyrostemonæ, Phytolaccacæ,* Coriariæ,* Tremandracæ,* Obalitiacæ,* Erythroxyleæ,* Chlénacæ, Ternstroemiaceæ, Dipterocarpeæ, Lophiracæ,* (Soulamæ, Trigonæ?)

ACERA: Polygalæ, (Vochysiaceæ?),* Melianthæ,* Rhizoboleæ,* Æsculinæ,* Sapindacæ,* Staphyleacæ, (Acer platanoid.) Acerinæ, Malpighiacæ,* Zygo-phylleæ, Rutacæ, Diosmæ (Bonninghausenia),* Ptelea, (Amyridæ? Burseracæ?)

AMYGDALIFERÆ: Anacardiaceæ, Xanthoxyleæ,* (Meliacæ,* Cedrelacæ,) (perigyn.) Aurantiacæ, Simarubæ, Connaracæ, Ochnacæ,* Cassalpinæ, Mimocæ, Papilionacæ, Sophoræ, Chrysobalanæ,* Amygdaliferæ (Prunus,* Spiræa) Rosæ (Rosa,* [epigyn.] Cratægus) Pomæ.

Note on the collection of Reptiles from the neighborhood of San Antonio, Texas, recently presented to the Academy of Natural Sciences by Dr. A. Heermann.

By EDW. HALLOWELL, M. D.

This fine collection, due to the zeal and liberality of our fellow member, consisting of sixty-nine specimens, includes a number new to our Museum, and many duplicates. Nearly all the species have been described by Profs. Baird and Girard, in their various publications in this Academy and elsewhere, but one appearing to be new, viz., *Hyla semifasciata*. The following is the list of the generic and specific names.

Ord. CHELONII.

Fam. CHELONIDÆ.

STAUBOTYPUS ODORATUS, (young.)

Ord. *SAURII*.Fam. *IGUANIDÆ*.*SCELOPORUS SCALARIS*, Wieg.*SCELOPORUS THAYERII*, B. and G.Fam. *LACERTIDÆ*.*CNEMIDOPHORUS GULARIS*, B. and G.Fam. *CHALCIDIDÆ*, (*CYCLOSAURES*, Duméril et Bibron.)1st Sub. Fam. *CYCLOSAURA PTYCHOPLEURA*, D. & B.*OPHISAURUS VENTRALIS*, var.

This specimen of *Ophisaurus* differs from the others in the collection of the Academy. Color olive beneath; sides black spotted, the spots in longitudinal rows, their posterior margins bordered with white; two olive colored longitudinal stripes along the back and greater part of tail; head blackish, white spotted above and upon the sides; body olive colored above, white spotted. Total length 26 inches; tail 18.

Ord. *OPHIDII*.(2d Sub. Ord. *AGLYPHODONTES* OR *COLUMBERIFORMES*, D. and B.)Fam. *ISODONTIDÆ*, D. and B. (*Serpentes innocui*.)*HERPETODRYAS ÆSTIVUS*.*HERPETODRYAS FLAVIGULARIS*.*ELAPHIS LINDENHEIMERII*.(Syn. *SCOTOPHIS LINDENHEIMERII*, B. and G.)*ARLATES TRIANGULUM*, (var. *EXIMUS*.)Fam. *LEPTOGNATHIDÆ*, D. and B.*STONERIA*, (*ISCHOGNATHUS*, D. and B.) DeKayi.

Numerous specimens.

Fam. *SYNCRATERIDÆ*, D. and B.*TROPIDONOTUS ORDINATUS*, var.

(EUTAINIA MARCIANA, B. and G.)

TROPIDONOTUS ERYTHROGASTER.5th Sub. Ord. *SOLENOGLYPHES* DITS *THANATOPHIDES*, D. and B. (*venenosi*.)Fam. *CROTALIDÆ*.*CROTALUS CONFLUENTUS*.*CROTALUS ATROX*, B. and G.*TOXICOPHIS PUGNAX*.Ord. *BATRACHII*.2d Sub. Ord. *ANURA*.1st Group. Les *PHANEROGLOSSES*, D. and B.2d Fam. *HYLIDÆ*.*HYLA SEMIFASCIATA*, nob.

Char. Of moderate size, larger than *lateralis*; snout less acute than in latter species; head depressed, snout rounded, nostrils small, considerably nearer to the extremity of the snout than the anterior margin of the orbit, a line and three-quarters apart; eyes not remarkably prominent; body elongated, smooth above.

except towards occiput; head granulated above; abdomen and under part of thighs largely granulated; tongue obcordate, notched posteriorly, free to some extent posteriorly and upon the sides, attached in front; vomerine teeth in two patches between the posterior nares; the latter subcircular; fingers webbed at their bases; toes more largely webbed, the web of the fourth toe extending to the distal extremity of the anti-penultimate phalanx.

Color. Bluish above, (probably green during life,) green upon the extremities; the greater part of abdomen and the under part of thighs ochraceous; chin and throat yellow; a white band extending above the margin of the upper jaw, passing beneath the eye, and terminating midway upon each side of the body; a white band commencing midway upon the posterior aspect of the tibia, extending along the outer margin of the tarsus and terminating at the base of the second phalanx of the fifth toe or a little beyond it; no stripe upon the tibia anteriorly.

Dimensions. Length of head $6\frac{1}{2}$ lines; breadth 7; length from extremity of snout to posterior extremity of body 2 inches $1\frac{1}{2}$ lines; length of arm 5 lines; of forearm 5; of band to extremity of longest finger $7\frac{1}{2}$; of thigh 1 inch 2 lines; of tibia 1 inch 1 line; of tarsus $7\frac{1}{2}$; of sole to extremity of longest toe 11 lines.

Habitat. Texas.

Gen. Remarks. This is a larger species than *Hyla lateralis*, the length of which, according to Daudin, is "un pouce et demi au plus." Dr. Holbrook's specimen, however, measured $1\frac{1}{2}$ inches. The largest specimen in the collection of the Academy measures $1\frac{1}{2}$ inches, (Fr.) It is a much more slender animal than *semifasciata*. In *lateralis*, (viridis, Holb.) the lateral stripe extends as far as the anus, and there is a white band running the whole length of the tibia, both anteriorly and posteriorly. The anterior band is absent in *semifasciata*.

3d Fam. BUFONIDÆ.

BUFO NEBULIFER, Girard.

Syn. BUFO GRANULOSUS, B. and G.—Proceed. A. N. S. vol. vi. p. 173.

Char. Head triangular, depressed, about as broad as long, with two sharp elevated ridges extending from the extremity of the snout along the inner margin of the eyelids; this ridge bifurcates about two-thirds of the distance along the inner margin, the external branch terminating in a thick ridge immediately above the tympanum, which itself sends off a prolongation anteriorly, passing down between the orbit and the tympanum, and terminating on a level with the inferior margin of the former; the supra-orbital ridge sends off also anteriorly a prolongation or branch, which passes down obliquely in front of the orbit, terminating in a line with its inferior border, leaving a triangular space upon the side of the head anteriorly; the internal branch above terminates on a level with the superior margin of the parotid gland about a line from it, and reaches nearly to the posterior margin of the occiput; the extremities of the two are two lines and a half apart posteriorly. These elevated and well defined ridges produce several well marked depressions, or rather concavities, the one long and broad, upon the middle of the upper part of the head, the other two lateral and posterior, and much smaller, the posterior margin formed in part by the anterior margin of the parotids; nostrils small, just within the anterior extremity of the supra-orbital ridge; tympanum rather small, round, very apparent; no teeth in the upper or lower jaw; no palatine or vomerine teeth; internal nares rather large, suboval; a slightly elevated ridge in front; upper jaw notched anteriorly; tongue long, narrow, broader posteriorly, erectile, not notched behind, attached in front, free to some extent laterally; eustachian foramina triangular in shape, rather smaller than anterior nares apparently; extremities moderate; toes 4-5, first and fourth finger longest; two subpalmar tubercles, with a well marked ridge in the middle; fourth toe much the longest; posterior extremities webbed at the base, the web of the fourth toe reaching to the base of the ante-penultimate phalanx; no webs anteriorly; body moderately robust, thickly covered

with warts; parotids small, covered with pores; under parts thickly covered all over with granulations.

Coloration. Brownish black above, with a yellowish dorsal band extending from the occiput to near the anus; on either side of this a number of jet black blotches, not always very distinct; head olive colored above or fuscous, a black spot in front of each parotid and upon occiput, in the latter situation sometimes coalescing so as to form an irregular band; the spots in front of the parotids not always present; an olive colored irregular broad band upon the sides, commencing at the parotids and extending upon the thighs; thighs mottled posteriorly with yellow; extremities broadly banded with brown, and narrowly with yellow; under parts ochraceous. In a specimen procured from Prof. Agassiz, and deposited in the Academy by Dr. Holbrook, the ground color of the body above is black, the dorsal and lateral bands fuscous, extremities banded with black, under parts fuscous.

Dimensions of largest specimen. Length 3 inches (Fr.) from extremity of snout to posterior extremity of body; length of head 1 inch 2 lines; greatest breadth 1 inch 2 lines; length of arm 8 lines; of forearm 9 lines; of palm of hand to extremity of longest finger 8 lines; of thigh 1 inch 1 line; of tibia 1 inch 1 line; of tarsus $8\frac{1}{2}$ lines; of sole to extremity of longest toe 1 inch.

Hab. Texas. Seven specimens in Museum of Acad. Nat. Sciences.

Gen. Remarks. This toad is decidedly South American in its type, differing entirely in the configuration of the head from any of the North American species.

It is remarkable, as we have before observed, that the fresh water turtles in Texas and New Mexico appear to be so rare, and we have as yet received none of the Salamandridæ from either of these regions, with the exception of an *Ambystoma*, viz., *A. nebulosum*.

Besides the above we have recently received from Dr. Hammond, of the U. S. Army, stationed at Fort Riley, Kansas, a further collection of reptiles, viz., *Crotaphytus collaris*, two specimens. One of these has a double interrupted black collar, the body above marked with transverse lines of white spots, the interspaces minutely white spotted; chin and tail marked with bluish; abdomen, under parts of extremities and tail immaculate; intermaxillary teeth small, followed by others larger, conical, the posterior teeth tricuspid; palatine teeth very remarkably developed; tongue slightly notched in front and free, emarginate posteriorly; eighteen femoral pores on each side. Three specimens of *Phrynosoma Douglassii*, one of *Cnemidophorus gularis*, B. and G., one of *Ophisaurus ventralis*, (striatulus, Cuv.) two of *Coryphodon constrictor*, (young,) one 1 foot 10 lines in length, with the usual markings; one of *Elaphis conifinis*? (*Scotophis conifinis*, B. and G.) 1 foot 2 inches 8 lines in length; 25 rows of scales; abdom. scut. 233; sub. cand. 62; 29 black blotches upon body, 8 upon tail, a smaller intermediate lateral row of black spots on each side; abdomen black spotted. (We have recently received the same species from Dennisville, Cape May County, New Jersey, presented by our fellow member S. Ashmead. In this specimen, which is smaller, there are from 25 to 27 rows of scales.) One of *Ablabes triangulum*, (var. *calligaster*;) 25 rows of scales; a triangular spot with its base resting on the frontal; the apex extending one and a half lines behind the posterior margin of the occipitals, and two long blotches commencing about half a line behind the post-oculars, each about three-fourths of an inch in length; transverse blotches narrow. One fine specimen of *Coronella*, similar to the one described in the last number of the Proceedings, but much larger, measuring 1 foot $11\frac{1}{2}$ inches in length, and two inches in circumference. (The red blotches in this specimen are for the most part much wider apart, the black rings approaching each other near and upon the tail; in one spot near the tail the red has almost totally disappeared.) One *Coronella Sayi*, (young,) var. see Marcy's Report, pl. vii. One *Heterodon nasicus*. One *Bufo punctatus*, (young of *Americanus*.) Three *Ambystoma*, (var. *luridum*,) and two *Siredons*. These

specimens are stouter than those in the collection of the Academy from Santa Fé, New Mexico. (Lichenoides, B. & G.) The ground color is yellowish mingled with white, the surface minutely punctated with small black dots; the surface of head, body and tail covered with innumerable pustulations; these are much less distinct upon the abdomen; the small lichenoid patches are quite distinct. Notwithstanding the greater narrowness of the head and body in the Santa Fé specimens, and less obtuse muzzle, we are not prepared to consider them specially distinct from those from Kansas—(Brilger's Pass, expedition in summer of 1856.) The *Coronella*, *Heterodon*, *Ophisaurus* and specimens of *Ambystoma*, are all marked from Brilger's Pass. The others from neighborhood of Fort Riley, Kansas.

A short time ago we received from Dr. Miles, of the town of Flint, Michigan, a small collection of reptiles, including *Tropidonotus ordinatus*, *parietalis*, *liberis*, *Herpetotrypa vernalis*, *Storeria occipito-maculata*, B. and G., and one *Scincus*, which appears to be new, and of which the following is a description:

PLESTIODON VITTIGERUM, nob.

Char. Color grey above, with three broad lighter colored stripes extending the whole length upon the back, and becoming lost upon the tail: two narrower ones upon the sides; a broad black band between the external of the dorsal vitta; and the inferior lateral stripe; under parts white.

Description. The head is of moderate size, slightly swollen at the temples; the rostral plate rounded, heptagonal, broader than long; two superno-nasals contiguous; a broad internasal; two fronto-nasals; a frontal pentangular, broader in front, the sides slightly excavated; two fronto-parietals somewhat larger than the fronto-nasals; an inter-parietal longer than broad; two parietals; nostril between two plates; a naso-frenal; two frenals, the second larger but not so high as the first; two freno-orbitals; eight superior labials; five supra-ocular plates; body moderate; tail longer than head, neck and body; 28 rows of broad and smooth hexagonal scales, rounded posteriorly; three or four scales in front of the auricular openings; third and fourth fingers of nearly equal length, fourth toe the longest.

Coloration. Head grayish, obscurely spotted and maculated with black; dorsal vitta margined with interrupted spots of black; extremities maculated with black above; a narrow white stripe upon the thigh posteriorly; under parts white, immaculate.

Dimensions. Length of head 7 lines; breadth $5\frac{1}{2}$; length of body to vent 2 inches 1 line; of tail 3 inches 10 lines; of arm $2\frac{3}{4}$ lines; of forearm 3 lines; of palm to extremity of longest finger 4 lines; of thigh 4 lines; of leg $3\frac{1}{2}$; of sole to extremity of longest toe 6 lines.

Habitat. Neighborhood of Flint, Michigan. One specimen in Mus. Acad. presented by Dr. Miles.

Gen. Remarks. This may possibly be a variety of *Plestiodon quinquelineatus*; it differs, however, much from the latter in the coloration, and in the greater breadth of the scales.

Description of a new genus of Colubri-form Serpents from California.

By EDW. HALLOWELL, M. D.

Gen. LAMPROSOMA.

Char. Teeth of equal length, posterior ones not channelled; head small, snout rounded, internasals somewhat smaller than prefrontals; frontal short and broad; nostril in a single plate; a long and narrow frenal; one antocular, two postoculars; body long and slender, depressed; scales smooth, quadrangular, brilliant; tail short, obtuse; subcaudal scutes bifid.

LAMPROMOMA OCCIPITALE, nob.

Syn. RHINOSTOMA OCCIPITALE, Proceed. A. N. S. vol. vii. 1854, p. 95.

Char. 15 rows of smooth quadrangular scales; color milk white above, with 34 transverse black bands, including one upon posterior part of head; six complete rings of black upon the tail, and one incomplete just behind the anus; jaws, chin, throat and abdomen white; interspaces between rings upon under part of tail white. Length of head, neck and body 10 inches 1 line; of tail 1 inch 7 lines. Ab. scut. 158; sub. caud. 34.

Habitat. Mohave Desert, Southern California. One specimen in Smithsonian Institution, collected by Dr. A. L. Heermann.

Gen. Remarks. Allied to Simotes, but in the latter the nostril opens between two plates, and the snout is conical.

Notice of extinct Vertebrata discovered by Dr. F. V. Hayden, during the expedition to the Sioux country under the command of Lieut. G. K. Warren.

By JOSEPH LEIDY, M. D.

MAMMALIA.

1. MERYCHIPPUS INSIGNIS, Leidy.

Founded upon a first and second molar of the upper jaw of a remarkable equine animal, in the structure of the teeth approximating the ruminant family.

The teeth are inserted by distinct fangs; and the crowns strikingly resemble the true molars of ruminants. There are four demiconoidal lobes holding the same relationship with one another as in the latter, especially as in the Deer. The outer lobes have almost the exact form as in the true molars of *Oreodon*. The inner lobes resemble those of ruminants, but are complicated with accessory folds as in the horse. No cementum fills up the inter-spaces of the lobes nor does it appear to have existed as part of the structure of these teeth.

Antero-posterior diameter of first molar 12 lines; transverse 8 lines.
" " " second molar 10 " " 9 "

From the tertiary beds of Bijoux Hills on the Upper Missouri.

2. HIPPARION (HIPPOPOS) SP. NOVUM, Leidy. Pr. A. N. S. VII. 90.

Accompanying an inferior molar, there is an unworn upper molar and portions of three other upper molars, worn away in various degrees, which appear to be the teeth of *Hipparion*, and appear to belong to the same animal as the tooth referred to *Hipparion*. The inferior molar slightly worn is 14 inches long, 10 lines wide, and 4 lines thick. The unworn upper molar is 20 lines long, 11 lines antero-posteriorly, and 9 lines transversely.

Found with the preceding at Bijoux Hills.

3. LEPTACRIS PRIMA, Leidy.

Founded on a single specimen of an upper molar tooth, which bears considerable resemblance to the fourth superior molar of the Coati. The tooth has a truncated crown as in the latter and also has three fangs. The inner part of tubercles of the crown are nearly equal in size; that anteriorly being less well, and that posteriorly better developed than in the Coati. Of the three outer tubercles that anteriorly is more like a talon than a cusp, and the posterior tubercle is better developed in its relation with the median one. I think the specimen represents a genus allied to the *Nasua*.

Found with the preceding at Bijoux Hills.

4. THECOSAUS OCCIDENTALIS, Leidy.

Among the collection of vertebrate remains are two apparent caudal vertebrae and a first phalanx of some huge animal, which I suspect to be a *Dinoceras*, though they may have belonged to a mammalian. The phalanx and one

vertebra were discovered by Dr. Hayden in the lowest member of the Lignite formation of Grand River, Nebraska. The other vertebra was obtained by Capt. Alfred Sully from an Indian, and is presented to the Academy. The specimen Dr. Hayden supposes to have been derived from the same locality.

The vertebral bodies very much resemble those of the lumbar vertebrae of the elephant in form and size, but they possess articular processes of a very distinct character, and one inch in diameter, for chevron bones. Viewed in front, the bodies are quadrately oval in outline and notched above, one of them being 5 inches in diameter, the other $4\frac{1}{2}$ inches deep and $4\frac{1}{2}$ transversely. Their length is about $2\frac{3}{4}$ inches; their anterior face is convex, and their posterior face is concave, with a depth of almost half an inch. The transverse processes, broken away, projected from the conjunction of the vertebral arches and bodies. The spinal foramen, retained entire in the smaller specimen, is circular, and one inch in diameter.

The first phalanx is 5 inches long, $4\frac{1}{2}$ wide at base and $3\frac{1}{2}$ thick in the same position; and 4 inches wide and $2\frac{1}{2}$ thick at the distal end. Deep concavities exist each side of the latter for the lateral ligaments. The proximal articulation is a transverse reniform concavity; the distal articulation a transverse convexity, slightly concave towards the middle.

CHELONIA.

5. *COMPSEMYS VICTUS*, Leidy.

Founded on a vertebral plate, the greater portion of the fifth costal plate, and a fragment of the last costal plate, from Long Lake, Nebraska.

The vertebral plate is an inch broad and nearly the same length. The fifth costal plate is $1\frac{1}{4}$ inches wide, and 2 lines thick, and in its perfect condition appears to have been almost 4 inches long. The fragment of a last costal plate is 3 lines thick.

The marking of the third or fourth vertebral scutes upon the fifth costal plate indicates them to have been about 2 inches in width.

The free surface of all the bones is thickly studded with granular tubercles, which give to it a shagreened appearance, different from anything observed in recent turtles.

6. *EMYS OBSCURUS*, Leidy.

Found with the preceding, were the fragments of a costal plate, which is 16 lines wide, $1\frac{1}{2}$ lines thick, and when perfect appears to have been almost 5 inches long. Its free surface is smooth.

7. *TRIONYX FOVEATUS*? Leidy. Proc. A. N. S., VIII. 73.

Fragments of a last costal plate, of the right side, 4 lines in thickness, were found with the preceding.

PISCES.

8. *MYLOGNATHUS PRISCUS*, Leidy.

Founded on an upper maxillary bone of a small chimæroid fish, found in company with the above mentioned remains of turtles, at Long Lake, Nebraska. The bone forms a narrow triangle which, in its perfect condition, appears to have been only a little over an inch in length, and it is $3\frac{1}{2}$ lines wide at the posterior part. Two teeth occupy the whole length and breadth of its surface. Their free surface is convex and porous. The posterior one is almost 8 lines long, and the anterior one about 6 lines.

Descriptions of three new genera; twenty-three new species Middle Tertiary Fossils from California, and one from Texas.

By T. A. CONRAD.

JANIRA, Shum.

Janira bella. Subtriangular; inferior valve convex, ribs 14 or 15, square, about as wide as the intervening spaces, very prominent, some of them with

one or two longitudinal obsolete lines; disk finely wrinkled concentrically; upper valve flattened, deeply depressed towards the apex; ribs rather narrower than those of the opposite valve, obscurely bicarinated above, disk ornamented with close, fine, squamose, concentric wrinkles. Length 4 inches; height $3\frac{1}{2}$ inches.

Locality.—Santa Barbara, Cal. Dr. Newberry.

PALLIUM, Klein.

1. *P. estrellanum*. Suborbicular; lower valve ventricose, slightly undulated; ribs 17, broad, little prominent, convex, with an intermediate linear rib, from which the larger ribs are separated by an impressed line; upper valve convex, somewhat undulated, ribs flattened and the intermediate small ribs with a longitudinal impressed line on the lower part of the valve. Height $2\frac{1}{2}$ inches.

Locality. Estrella valley, Cal. Dr. Newberry.

2. *P. crassicardo*. Obtusely ovate or suborbicular, thick; lower valve ventricose; ribs 15—16, elevated, back rounded, sides flattened, disks radiostriate, 9 or 10 on the ribs, intervals of ribs concave, umbo or whole disk at wide intervals having a tendency to be humped and nodose; upper valve convex or slightly ventricose; ears large, equal; hinge thick, with prominent, acute, oblique teeth; fosset profound; muscular impression very large. Height 5 inches.

Locality. Monterey Co., Cal. A. S. Taylor.

PECTEN, Lin.

1. *Pecten Meekii*. Suborbicular, compressed; ribs 19 not very prominent, convex-depressed on the back, angulated on the sides. Height $6\frac{1}{2}$ inches.

Locality. San Raphael Hills. Mr. Antisell.

2. *P. altiplectus*. Obtusely ovate; ribs squamose, slender, 9 of them distant profoundly elevated. Height $2\frac{1}{2}$ inches.

Locality. With the preceding. Mr. Antisell.

PACHYDESMA, Conrad.

P. Inezana. Triangular, equilateral; anal side subcuneiform; teeth robust.

Locality. Santa Inez Mountains. Mr. Antisell.

MULINIA, Gray.

M. densata. Subovate, ventricose, thick, very inequilateral; posterior side very short comparatively, contracted; extremity subtruncated, much above the line of the base; posterior basal margin very oblique and contracted; anterior end obliquely truncated; anterior basal margin rounded; summits prominent, distant; lateral teeth very robust and prominent; inner margin entire. Length $2\frac{1}{2}$ inches.

Locality. Santa Barbara, Cal. Dr. Newberry.

THRACIA, Leach.

Thracia mactropis. Subtriangular, subequilateral, ventricose; anterior side cuneiform or subrostrated, posterior end regularly rounded; ligament margin very oblique; base regularly and profoundly rounded; umbonal slope abruptly rounded; summit prominent, posterior to the middle of the valve; anterior extremity angular. Length 1 inch.

Locality.—Monterey Co., California. Dr. Newberry.

MYA, Lin.

Mya Montereyana. Suboval, slightly ventricose, thin, inequilateral; summit hardly prominent; anterior end subtruncated? posterior end acutely rounded.

ganiaceæ, (Antonia, * Syringa) Ligustrinæ, * Gentianæ (Ohlora, * Nyctanthes) Jasminæ, (Nolana? Cordiaceæ?), Bolivareæ, Apocynæ, Asclepiadæ, (Erycibe, * Ouscuta?), Convolvulacæ, * Cobæa, * Petuniæ, * Goodeniaceæ, * Plumbago, * (Phlox) Polemoniaceæ, Hydrophyllæ (Phacelia, * nuculifera: Heliotropium) Borraginæ.

PERSONATÆ: (Ajuga) Labiatæ (Lavandula, * Vitex) Verbenacæ (Verbena stricta, bracteosa!), capsulares: Plantaginæ, * Globularia, Selaginæ, Stilbinæ, Rhinanthacæ, * Orobanchæ, * Cytinæ, * (compar. Russeggera etc.) Acanthacæ (Ruellia, * Trevirana) Gesneriaceæ (Columnnæ, * Stenochilus etc.) Myoporinæ, (Duboisia myoporoides, *) Salpiglossæ, Scrophulariæ, (Paulownia), Bigoniaceæ, (Eccremocarpus, * Martynia) Pedalinæ (Josephinia, * Datura) Solanæ, Primulacæ (incl. Lentibulariæ.)

OLIVARES: Myrsinæ, Sapotæ, Ebenacæ (Roxana, * Unedo) Rhododendræ (Kalmia, * Epacris impressa) Epacridæ, (Fabiana) Ericacæ, (epigyn.) Vacciniæ, (apetal.) Loranthacæ, * Santalacæ, * (perigyn.,) * (Phyllicæ,) Rhamnæ, Celastriinæ, * Hamamelidæ, * Pittosporæ, * Hippocrateacæ, * Aquifoliacæ, * (Nitariæ, Putranjivæ?), * Empetræ, * (Celtis, Ulmus, Fraxinæ?), * Oleacæ, * (epigyn.) Nyssæ, * Cornæ, * Styracæ, * Rubiacæ, Loniceræ.*

TIARATÆ: (Viburnum, * Hydrangea) Hydrangeæ, Escallonienæ, * Dilleniaceæ, * Cunoniaceæ, Crassulacæ, Saxifragæ, Ribesiaceæ, * (Fuchsia) Onagrarinæ (Lopezia), * Melastomæ, Cupheacæ, Lagerstromiæ, * Puniceæ, Myrtacæ, * Trapa, * Rhizophoræ, Combretacæ, Cactæ, Mesembryanthemum, (subhypogyn.) Portulacacæ.*

COLUMNIFERÆ: (hypogyn.) Cistinæ, * Tillacæ, Byttneriacæ, Sterculiacæ, Malvacæ, Gyrostemonæ, Phytolaccacæ, * Coriariæ, * Tremandracæ, * Chailletiacæ, * Erythroxylæ, * Chlisanæ, Ternstroemiaceæ, Diptercarpæ, Lophiracæ, * (Soulanæ, Trigonæ?)

ACERÆ: Polygalæ, (Vochysiaceæ?), * Melianthæ, * Rhizobolæ, * Esculinæ, * Sapindacæ, * Staphyleacæ, (Acer platanoid.) Acerinæ, Malpighiacæ, * Zygo-phylleæ, Rutacæ, Diosmæ (Bœnnighausenia), * Pteleæ, (Amyridæ? Burseracæ?)

AMYGDALIFERÆ: Anacardiaceæ, Xanthoxylæ, * (Meliacæ, * Cedrelacæ,) (perigyn.) Aurantiacæ, Simarubæ, Connaracæ, Ochnacæ, * Cæsalpiniciæ, Mimosæ, Papilionacæ, Sophoræ, Chrysobalanæ, * Amygdaliferæ (Prunus, * Spiræa) Rosæ (Rosa, * [epigyn.] Cratægus) Pomæ.

Note on the collection of Reptiles from the neighborhood of San Antonio, Texas, recently presented to the Academy of Natural Sciences by Dr. A. Heermann.

By EDW. HALLOWELL, M. D.

This fine collection, due to the zeal and liberality of our fellow member, consisting of sixty-nine specimens, includes a number new to our Museum, and many duplicates. Nearly all the species have been described by Profs. Baird and Girard, in their various publications in this Academy and elsewhere, but one appearing to be new, viz., *Hyla semifasciata*. The following is the list of the generic and specific names.

Ord. *CHELONII*.

Fam. *CHELONIDÆ*.

STAUBOTYPUS ODORATUS, (young.)

Ord. *SAURII*.Fam. *IGUANIDÆ*.*SCELOPORUS SCALARIS*, Wieg.*SCELOPORUS THAYERII*, B. and G.Fam. *LACERTIDÆ*.*CNEMIDOPHORUS GULARIS*, B. and G.Fam. *CHALCIDIDÆ*, (*CYCLOSAURES*, Duméril et Bibron.)1st Sub. Fam. *CYCLOSAURA PTYCHOPLEURA*, D. & B.*OPHISAURUS VENTRALIS*, var.

This specimen of *Ophisaurus* differs from the others in the collection of the Academy. Color olive beneath; sides black spotted, the spots in longitudinal rows, their posterior margins bordered with white; two olive colored longitudinal stripes along the back and greater part of tail; head blackish, white spotted above and upon the sides; body olive colored above, white spotted. Total length 26 inches; tail 18.

Ord. *OPHIDII*.(2d Sub. Ord. *AGLYPHODONTES* OR *COLUBERIFORMES*, D. and B.)Fam. *ISODONTIDÆ*, D. and B. (*Serpentes innocui*.)*HERPETODRYAS ÆSTIVUS*.*HERPETODRYAS FLAVIGULARIS*.*ELAPHS LINDENHEIMERII*.(Syn. *SCOTOPHIS LINDENHEIMERII*, B. and G.)*ABLATES TRIANGULUM*, (var. *EXIMIUS*.)Fam. *LEPTOGNATHIDÆ*, D. and B.*STORERIA*, (*ISCHOGNATHUS*, D. and B.) DeKayi.

Numerous specimens.

Fam. *SYNCRATERIDÆ*, D. and B.*TROPIDONOTUS ORDINATUS*, var.

(EUTAINIA MARCIANA, B. and G.)

TROPIDONOTUS ERYTHROGASTER.3th Sub. Ord. *SOLENOGLYPHES* DITS *THANATOPHIDES*, D. and B. (venenous.)Fam. *CROTALIDÆ*.*CROTALUS CONFLUENTUS*.*CROTALUS ATROX*, B. and G.*TOXICOPHIS PUGNAX*.Ord. *BATRACHII*.2d Sub. Ord. *ANOURA*.1st Group. Les *PHANEROGLOSSES*, D. and B.2d Fam. *HYLIDÆ*.*HYLA SEMIFASCIATA*, nob.

Char. Of moderate size, larger than *lateralis*; snout less acute than in latter species; head depressed, snout rounded, nostrils small, considerably nearer to the extremity of the snout than the anterior margin of the orbit, a line and three-quarters apart; eyes not remarkably prominent; body elongated, smooth above.

except towards occiput; head granulated above; abdomen and under part of thighs largely granulated; tongue obcordate, notched posteriorly, free to some extent posteriorly and upon the sides, attached in front; vomerine teeth in two patches between the posterior nares; the latter subcircular; fingers webbed at their bases; toes more largely webbed, the web of the fourth toe extending to the distal extremity of the anti-penultimate phalanx.

Color. Bluish above, (probably green during life,) green upon the extremities; the greater part of abdomen and the under part of thighs ochraceous; chin and throat yellow; a white band extending above the margin of the upper jaw, passing beneath the eye, and terminating midway upon each side of the body; a white band commencing midway upon the posterior aspect of the tibia, extending along the outer margin of the tarsus and terminating at the base of the second phalanx of the fifth toe or a little beyond it; no stripe upon the tibia anteriorly.

Dimensions. Length of head $6\frac{1}{2}$ lines; breadth 7; length from extremity of snout to posterior extremity of body 2 inches $1\frac{1}{2}$ lines; length of arm 5 lines; of forearm 5; of band to extremity of longest finger $7\frac{1}{2}$; of thigh 1 inch 2 lines; of tibia 1 inch 1 line; of tarsus $7\frac{1}{2}$; of sole to extremity of longest toe 11 lines.

Habitat. Texas.

Gen. Remarks. This is a larger species than *Hyla lateralis*, the length of which, according to Daudin, is "un pouce et demi au plus." Dr. Holbrook's specimen, however, measured $1\frac{1}{2}$ inches. The largest specimen in the collection of the Academy measures $1\frac{1}{2}$ inches, (Fr.) It is a much more slender animal than *semifasciata*. In *lateralis*, (viridis, Holb.) the lateral stripe extends as far as the anus, and there is a white band running the whole length of the tibia, both anteriorly and posteriorly. The anterior band is absent in *semifasciata*.

3d Fam. BUFONIDÆ.

BUFO NEBULIFER, Girard.

Syn. BUFO GRANULOSUS, B. and G.—Proceed. A. N. S. vol. vi. p. 173.

Char. Head triangular, depressed, about as broad as long, with two sharp elevated ridges extending from the extremity of the snout along the inner margin of the eyelids; this ridge bifurcates about two-thirds of the distance along the inner margin, the external branch terminating in a thick ridge immediately above the tympanum, which itself sends off a prolongation anteriorly, passing down between the orbit and the tympanum, and terminating on a level with the inferior margin of the former; the supra-orbital ridge sends off also anteriorly a prolongation or branch, which passes down obliquely in front of the orbit, terminating in a line with its inferior border, leaving a triangular space upon the side of the head anteriorly; the internal branch above terminates on a level with the superior margin of the parotid gland about a line from it, and reaches nearly to the posterior margin of the occiput; the extremities of the two are two lines and a half apart posteriorly. These elevated and well defined ridges produce several well marked depressions, or rather concavities, the one long and broad, upon the middle of the upper part of the head, the other two lateral and posterior, and much smaller, the posterior margin formed in part by the anterior margin of the parotids; nostrils small, just within the anterior extremity of the supra-orbital ridge; tympanum rather small, round, very apparent; no teeth in the upper or lower jaw; no palatine or vomerine teeth; internal nares rather large, suboval; a slightly elevated ridge in front; upper jaw notched anteriorly; tongue long, narrow, broader posteriorly, erectile, not notched behind, attached in front, free to some extent laterally; eustachian foramina triangular in shape, rather smaller than anterior nares apparently; extremities moderate; toes 4—5, first and fourth finger longest; two subpalmar tubercles, with a well marked ridge in the middle; fourth toe much the longest; posterior extremities webbed at the base, the web of the fourth toe reaching to the base of the ante-penultimate phalanx; no webs anteriorly; body moderately robust, thickly covered

with warts; parotids small, covered with pores; under parts thickly covered all over with granulations.

Coloration. Brownish black above, with a yellowish dorsal band extending from the occiput to near the anus; on either side of this a number of jet black blotches, not always very distinct; head olive colored above or fuscous, a black spot in front of each parotid and upon occiput, in the latter situation sometimes coalescing so as to form an irregular band; the spots in front of the parotids not always present; an olive colored irregular broad band upon the sides, commencing at the parotids and extending upon the thighs; thighs mottled posteriorly with yellow; extremities broadly banded with brown, and narrowly with yellow; under parts ochraceous. In a specimen procured from Prof. Agassiz, and deposited in the Academy by Dr. Holbrook, the ground color of the body above is black, the dorsal and lateral bands fuscous, extremities banded with black, under parts fuscous.

Dimensions of largest specimen. Length 3 inches (Fr.) from extremity of snout to posterior extremity of body; length of head 1 inch 2 lines; greatest breadth 1 inch 2 lines; length of arm 8 lines; of forearm 9 lines; of palm of hand to extremity of longest finger 8 lines; of thigh 1 inch 1 line; of tibia 1 inch 1 line; of tarsus $8\frac{1}{2}$ lines; of sole to extremity of longest toe 1 inch.

Hab. Texas. Seven specimens in Museum of Acad. Nat. Sciences.

Gen. Remarks. This toad is decidedly South American in its type, differing entirely in the configuration of the head from any of the North American species.

It is remarkable, as we have before observed, that the fresh water turtles in Texas and New Mexico appear to be so rare, and we have as yet received none of the Salamandridæ from either of these regions, with the exception of an *Ambystoma*, viz., *A. nebulosum*.

Besides the above we have recently received from Dr. Hammond, of the U. S. Army, stationed at Fort Riley, Kansas, a further collection of reptiles, viz., *Crotaphytus collaris*, two specimens. One of these has a double interrupted black collar, the body above marked with transverse lines of white spots, the interspaces minutely white spotted; chin and tail marked with bluish; abdomen, under parts of extremities and tail immaculate; intermaxillary teeth small, followed by others larger, conical, the posterior teeth tricuspid; palatine teeth very remarkably developed; tongue slightly notched in front and free, emarginate posteriorly; eighteen femoral pores on each side. Three specimens of *Phrynosoma Douglassii*, one of *Cnemidophorus gularis*, B. and G., one of *Ophisaurus ventralis*, (striatulus, Cuv.) two of *Coryphodon constrictor*, (young,) one 1 foot 10 lines in length, with the usual markings; one of *Elaphis conifinis*? (*Scotophis conifinis*, B. and G.,) 1 foot 2 inches 8 lines in length; 25 rows of scales; abdom. scut. 233; sub. caud. 62; 29 black blotches upon body, 8 upon tail, a smaller intermediate lateral row of black spots on each side; abdomen black spotted. (We have recently received the same species from Dennisville, Cape May County, New Jersey, presented by our fellow member S. Ashmead. In this specimen, which is smaller, there are from 25 to 27 rows of scales.) One of *Ablabes triangulum*, (var. *calligaster*;) 25 rows of scales; a triangular spot with its base resting on the frontal; the apex extending one and a half lines behind the posterior margin of the occipitals, and two long blotches commencing about half a line behind the post-oculars, each about three-fourths of an inch in length; transverse blotches narrow. One fine specimen of *Coronella*, similar to the one described in the last number of the Proceedings, but much larger, measuring 1 foot $11\frac{1}{2}$ inches in length, and two inches in circumference. (The red blotches in this specimen are for the most part much wider apart, the black rings approaching each other near and upon the tail; in one spot near the tail the red has almost totally disappeared.) One *Coronella Sayi*, (young,) var. see Marcy's Report, pl. vii. One *Heterodon nasicus*. One *Bufo punctatus*, (young of *Americanus*.) Three *Ambystoma*, (var. *luridum*,) and two *Siredons*. These

specimens are stouter than those in the collection of the Academy from Santa Fé, New Mexico, (*lichenoides*, Bd.?) The ground color is yellowish mingled with olive, the surface minutely punctated with small black dots; the surface of head, body and tail covered with innumerable pustulations; these are much less distinct upon the abdomen; the small lichenoid patches are quite distinct. Notwithstanding the greater narrowness of the head and body in the Santa Fé specimens, and less obtuse muzzle, we are not prepared to consider them specifically distinct from those from Kansas—(Bridger's Pass, expedition in summer of 1856.) The *Coronella*, *Heterodon*, *Ophisaurus* and specimens of *Ambystoma*, are all marked from Bridger's Pass. The others from neighborhood of Fort Riley, Kansas.

A short time ago we received from Dr. Miles, of the town of Flint, Michigan, a small collection of reptiles, including *Tropidonotus ordinatus*, *parietalis*, *liberis*, *Herpetodryas vernalis*, *Storeria occipito-maculata*, B. and G., and one *Scincus*, which appears to be new, and of which the following is a description:

PLESTIODON VITTIGERUM, nob.

Char. Color grey above, with three broad lighter colored stripes extending the whole length upon the back, and becoming lost upon the tail; two narrower ones upon the sides; a broad black band between the external of the dorsal vittæ and the inferior lateral stripe; under parts white.

Description. The head is of moderate size, slightly swollen at the temples; the rostral plate rounded, heptagonal, broader than long; two supero-nasals contiguous; a broad internasal; two fronto-nasals; a frontal pentangular, broader in front, the sides slightly excavated; two fronto-parietals somewhat larger than the fronto-nasals; an inter-parietal longer than broad; two parietals; nostril between two plates; a naso-frenal; two frenals, the second larger but not so high as the first; two freno-orbitars; eight superior labials; five supra-ocular plates; body moderate; tail longer than head, neck and body; 28 rows of broad and smooth hexagonal scales, rounded posteriorly; three or four scales in front of the auricular openings; third and fourth fingers of nearly equal length, fourth toe the longest.

Coloration. Head grayish, obscurely spotted and maculated with black; dorsal vittæ margined with interrupted spots of black; extremities maculated with black above; a narrow white stripe upon the thigh posteriorly; under parts white, immaculate.

Dimensions. Length of head 7 lines; breadth $5\frac{1}{2}$; length of body to vent 2 inches 1 line; of tail 3 inches 10 lines; of arm $2\frac{3}{4}$ lines; of forearm 3 lines; of palm to extremity of longest finger 4 lines; of thigh 4 lines; of leg $3\frac{3}{4}$; of sole to extremity of longest toe 6 lines.

Habitat. Neighborhood of Flint, Michigan. One specimen in Mus. Acad. presented by Dr. Miles.

Gen. Remarks. This may possibly be a variety of *Plestiodon quinquelineatus*; it differs, however, much from the latter in the coloration, and in the greater breadth of the scales.

Description of a new genus of Colubriiform Serpents from California.

By EDW. HALLOWELL, M. D.

Gen. LAMPROSOMA.

Char. Teeth of equal length, posterior ones not channelled; head small, snout rounded, internasals somewhat smaller than prefrontals; frontal short and broad; nostril in a single plate; a long and narrow frenal; one antocular, two postoculars; body long and slender, depressed; scales smooth, quadrangular, brilliant; tail short, obtuse; subcaudal scutes bifid.

LAMPROMOMA OCCIPITALE, nob.

Syn. RHINOSTOMA OCCIPITALE, Proceed. A. N. S. vol. vii. 1854, p. 95.

Char. 15 rows of smooth quadrangular scales; color milk white above, with 34 transverse black bands, including one upon posterior part of head; six complete rings of black upon the tail, and one incomplete just behind the anus; jaws, chin, throat and abdomen white; interspaces between rings upon under part of tail white. Length of head, neck and body 10 inches 1 line; of tail 1 inch 7 lines. Ab. scut. 158; sub. caud. 34.

Habitat. Mohave Desert, Southern California. One specimen in Smithsonian Institution, collected by Dr. A. L. Heermann.

Gen. Remarks. Allied to Simotes, but in the latter the nostril opens between two plates, and the snout is conical.

Notices of extinct Vertebrata discovered by Dr. F. V. Hayden, during the expedition to the Sioux country under the command of Lieut. G. K. Warren.

By JOSEPH LEIDY, M. D.

MAMMALIA.

1. MERYCHIPPUS INSIGNIS, Leidy.

Founded upon a first and second molar of the upper jaw of a remarkable equine animal, in the structure of the teeth approximating the ruminant family.

The teeth are inserted by distinct fangs; and the crowns strikingly resemble the true molars of ruminants. There are four demiconoidal lobes holding the same relationship with one another as in the latter, especially as in the Deer. The outer lobes have almost the exact form as in the true molars of *Odocoileus*. The inner lobes resemble those of ruminants, but are complicated with accessory folds as in the horse. No cementum fills up the interspaces of the lobes nor does it appear to have existed as part of the structure of these teeth.

Antero-posterior diameter of first molar 12 lines; transverse 8 lines.
 " " " second molar 10 " " 9 "

From the tertiary beds of Bijoux Hills on the Upper Missouri.

2. HYPARION (HIPPODON) SPERMOTOM, Leidy. Pr. A. N. S. VII. 90.

Accompanying an inferior molar, there is an unworn upper molar and portions of three other upper molars, worn away in various degrees, which appear to be the teeth of *Hyparion*, and appear to belong to the same animal as the tooth referred to *Hyparion*. The inferior molar slightly worn is $1\frac{1}{4}$ inches long, 10 lines wide, and 4 lines thick. The unworn upper molar is 20 lines long, 11 lines antero-posteriorly, and 9 lines transversely.

Found with the preceding at Bijoux Hills.

3. LEPTACRUS PRIMUS, Leidy.

Founded on a single specimen of an upper molar tooth, which bears considerable resemblance to the fourth superior molar of the Coati. The tooth has a triangular crown as in the latter and also has three fangs. The inner pair of tubercles of the crown are nearly equal in size; that anteriorly being less well, and that posteriorly better developed than in the Coati. Of the three outer tubercles that anteriorly is more like a talon than a cusp, and the posterior tubercle is better developed in its relation with the median one. I think the specimen represents a genus allied to the *Nasua*.

Found with the preceding at Bijoux Hills.

4. THESIOSUCHUS OCCIDENTALIS, Leidy.

Among the collection of vertebrate remains are two apparent caudal vertebrae and a first phalanx of some huge animal, which I suspect to be a *Diosaurus*, though they may have belonged to a mammalian. The phalanx and one

vertebra were discovered by Dr. Hayden in the lowest member of the Lignite formation of Grand River, Nebraska. The other vertebra was obtained by Capt. Alfred Sully from an Indian, and is presented to the Academy. The specimen Dr. Hayden supposes to have been derived from the same locality.

The vertebral bodies very much resemble those of the lumbar vertebrae of the elephant in form and size, but they possess articular processes of a very distinct character, and one inch in diameter, for chevron bones. Viewed in front, the bodies are quadrately oval in outline and notched above, one of them being 5 inches in diameter, the other $4\frac{1}{2}$ inches deep and $4\frac{1}{2}$ transversely. Their length is about $2\frac{3}{4}$ inches; their anterior face is convex, and their posterior face is concave, with a depth of almost half an inch. The transverse processes, broken away, projected from the conjunction of the vertebral arches and bodies. The spinal foramen, retained entire in the smaller specimen, is circular, and one inch in diameter.

The first phalanx is 5 inches long, $4\frac{1}{2}$ wide at base and $3\frac{1}{2}$ thick in the same position; and 4 inches wide and $2\frac{1}{2}$ thick at the distal end. Deep concavities exist each side of the latter for the lateral ligaments. The proximal articulation is a transverse reniform concavity; the distal articulation a transverse convexity, slightly concave towards the middle.

CHELONIA.

5. *COMPSEMYS VICTUS*, Leidy.

Founded on a vertebral plate, the greater portion of the fifth costal plate, and a fragment of the last costal plate, from Long Lake, Nebraska.

The vertebral plate is an inch broad and nearly the same length. The fifth costal plate is $1\frac{1}{2}$ inches wide, and 2 lines thick, and in its perfect condition appears to have been almost 4 inches long. The fragment of a last costal plate is 3 lines thick.

The marking of the third or fourth vertebral scutes upon the fifth costal plate indicates them to have been about 2 inches in width.

The free surface of all the bones is thickly studded with granular tubercles, which give to it a shagreened appearance, different from anything observed in recent turtles.

6. *EMYS OBSCURUS*, Leidy.

Found with the preceding, were the fragments of a costal plate, which is 16 lines wide, $1\frac{1}{2}$ lines thick, and when perfect appears to have been almost 5 inches long. Its free surface is smooth.

7. *TRIONYX FOVEATUS?* Leidy. Proc. A. N. S., VIII. 73.

Fragments of a last costal plate, of the right side, 4 lines in thickness, were found with the preceding.

PISCES.

8. *MYLOGNATHUS PRISCUS*, Leidy.

Founded on an upper maxillary bone of a small chimaeroid fish, found in company with the above mentioned remains of turtles, at Long Lake, Nebraska. The bone forms a narrow triangle which, in its perfect condition, appears to have been only a little over an inch in length, and it is $3\frac{1}{2}$ lines wide at the posterior part. Two teeth occupy the whole length and breadth of its surface. Their free surface is convex and porous. The posterior one is almost 8 lines long, and the anterior one about 6 lines.

Descriptions of three new genera; twenty-three new species Middle Tertiary Fossils from California, and one from Texas.

By T. A. CONRAD.

JANIRA, Shum.

Janira bella. Subtriangular; inferior valve convex, ribs 14 or 15, square, about as wide as the intervening spaces, very prominent, some of them with

one or two longitudinal obsolete lines; disk finely wrinkled concentrically; upper valve flattened, deeply depressed towards the apex; ribs rather narrower than those of the opposite valve, obscurely bicarinated above, disk ornamented with close, fine, squamose, concentric wrinkles. Length 4 inches; height $3\frac{1}{2}$ inches.

Locality.—Santa Barbara, Cal. Dr. Newberry.

PALLIUM, Klein.

1. *P. estrellanum*. Suborbicular; lower valve ventricose, slightly undulated; ribs 17, broad, little prominent, convex, with an intermediate linear rib, from which the larger ribs are separated by an impressed line; upper valve convex, somewhat undulated, ribs flattened and the intermediate small ribs with a longitudinal impressed line on the lower part of the valve. Height $2\frac{1}{2}$ inches.

Locality. Estrella valley, Cal. Dr. Newberry.

2. *P. crassicaudo*. Obtusely ovate or suborbicular, thick; lower valve ventricose; ribs 15—16, elevated, back rounded, sides flattened, disks radiostriate, 9 or 10 on the ribs, intervals of ribs concave, umbo or whole disk at wide intervals having a tendency to be humped and nodose; upper valve convex or slightly ventricose; ears large, equal; hinge thick, with prominent, acute, oblique teeth; fosset profound; muscular impression very large. Height 5 inches.

Locality. Monterey Co., Cal. A. S. Taylor.

PECTEN, Lin.

1. *Pecten Meekii*. Suborbicular, compressed; ribs 19 not very prominent, convex-depressed on the back, angulated on the sides. Height $6\frac{1}{2}$ inches.

Locality. San Raphael Hills. Mr. Antisell.

2. *P. altiplectus*. Obtusely ovate; ribs squamose, slender, 9 of them distant profoundly elevated. Height $2\frac{1}{2}$ inches.

Locality. With the preceding. Mr. Antisell.

PACHYDESMA, Conrad.

P. Inezana. Triangular, equilateral; anal side subcuneiform; teeth robust.

Locality. Santa Inez Mountains. Mr. Antisell.

MULINIA, Gray.

M. densata. Subovate, ventricose, thick, very inequilateral; posterior side very short comparatively, contracted; extremity subtruncated, much above the line of the base; posterior basal margin very oblique and contracted; anterior end obliquely truncated; anterior basal margin rounded; summits prominent, distant; lateral teeth very robust and prominent; inner margin entire. Length $2\frac{1}{2}$ inches.

Locality. Santa Barbara, Cal. Dr. Newberry.

THRACIA, Leach.

Thracia mictropia. Subtriangular, subequilateral, ventricose; anterior side cuneiform or subrostrated, posterior end regularly rounded; ligament margin very oblique; base regularly and profoundly rounded; umbonal slope abruptly rounded; summit prominent, posterior to the middle of the valve; anterior extremity angular. Length 1 inch.

Locality.—Monterey Co., California. Dr. Newberry.

MYA, Lin.

Mya Montereyana. Suboval, slightly ventricose, thin, inequilateral; summit hardly prominent; anterior end subtruncated? posterior end acutely rounded.

the extremity situated more nearly on a line with the beak than the base; disk concentrically rugoso-striate. Length $1\frac{1}{2}$ inches.

Locality.—Monterey, Cal. Dr. Newberry.

ARCA, Lin.

1. *Arca canalis*. Subtrapezoidal, ventricose; ribs 24—26, flattened, scarcely prominent, divided by a longitudinal furrow; disk concentrically wrinkled; umbo ventricose; summits prominent, remote from the centre. Length $2\frac{1}{2}$ inches. Height $1\frac{1}{4}$ inches.

Locality. Santa Barbara, Cal.

2. *Arca trilineata*. Trapezoidal, somewhat produced, inequilateral, ventricose; ribs 22—24, scarcely prominent, square, wider than the intervening spaces, ornamented with three impressed or four raised lines; disks concentrically wrinkled; summits prominent; beaks approximate. Length 3 inches.

Locality.—Occurs with the preceding.

3. *Arca congesta*. Rhomboidal, ventricose, inequilateral; ribs about 27, convex on the back, wider than the intervals which are transversely striate; anterior ribs crenate; ligament margin elevated; posterior end obtusely rounded; summits prominent. Length $\frac{3}{4}$ inch.

Locality.—California. Dr. Newberry.

AXINÆA, Poli. PECTUNCULUS, Lam.

Axinæa barbarentsis. Lentiform, subequilateral, concentrically wrinkled; ribs about 37, scarcely prominent, flat, defined by an impressed line, wanting on the submargins and obsolete towards the base; summits slightly prominent. Length $1\frac{1}{2}$ inches; height rather more than $1\frac{1}{2}$ inches.

ARCOPAGIA.

Arcopagia medialis. Oval, both valves slightly ventricose anteriorly; upper valve much contracted or concave towards the umbonal slope which is angulated; post-umbonal slope slightly contracted in the middle, emarginate at base; the corresponding slope of the lower valve deeply folded, reflected towards the extremity; disks rugoso-striate concentrically. It has an affinity to *A biplicata*, Conrad, but is proportionally longer.

Locality.—Monterey Co., Cal. A. S. Taylor.

TAPES, Sowerby.

Tapes linteatum. Oblong-oval, ventricose; buccal side short, extremity obtusely rounded; anal side elongated, end regularly rounded; ligament margin long, oblique, straight; disks radiated with fine, unequal lines, except on the post-umbonal slope which is entire. Length 2 inches.

Locality.—

Dr. Newberry.

CRYPTOMYA, Conrad.

Cryptomya ovalis. Oval, compressed, posterior end truncated; umbonal slope angulated on the umbo; beaks medial; basal margin medially truncated; disk medially flattened.

Locality.—Monterey Co., Cal. Dr. Newberry.

CYCLAS, Klein. LUCINA, Lam.

Cyclas tetra. Suboval, compressed? very inequilateral, somewhat oblique; disks concentrically striate; larger striæ prominent, acute, distant, the intervals with 4 or 5 unequal, fine, wrinkled lines; beaks scarcely prominent above the dorsal line. Length $1\frac{1}{2}$ inches.

Locality.—Monterey Co., Cal. A. S. Taylor.

SPONDYLUS.

Spondylus Estrallensis. Obtusely ovate; both valves ventricose; ribs 17, not very prominent, rounded, rugose; valves with radiating striae.

Locality.—Estrella valley. Mr. Antisell.

DOSINIA, Scopoli.

1. *Dosinia longula*. Regularly ventricose, inequilateral, longitudinally oval; margins and base regularly rounded; summit prominent; buccal margin more obtusely rounded than the anal. Length 1 1-5th inch.

Locality.—Monterey, Cal. Dr. Newberry.

2. *Dosinia alta*. Obtusely subovate or suboval from beak to base; posterior margin curved, profoundly oblique; base regularly and rather acutely rounded; summits prominent, oblique; surface marked with numerous fine, concentric, impressed lines; beaks medial. Height 4 inches.

Locality.—Monterey, Cal. Dr. Newberry.

LUTRARIA.

Lutraria transmontana. Longitudinally ovato-triangular, inequilateral, thin; anal side subcuneiform; surface concentrically indented, umbo irregularly plicated.

Locality.—Rancho Triumpho, near Los Angeles. Mr. Antisell.

SCHIZOPYGA, Conrad.

Bucciniform; columella concave, plicate; lower part of body volutions deeply channelled, the channel emarginating the columella.

Schizopyga Californiana. Volutions rounded, having revolving ribs and longitudinal furrows, giving the ribs a nodulous character; basal excavation profound.

Locality.—Santa Clara, Cal. Dr. Newberry.

TAMIOSOMA, Conrad.

An elongated tube, apparently entire, porous and cellular throughout its substance; interior filled with numerous irregularly-disposed vaulted cells connected by longitudinal slender tubes, funnel-shaped beneath; aperture resembling that of *Balanus*.

Tamiosoma gregaria. Subquadrangular, elongated, longitudinally furrowed and striate, and having fine, undulated, transverse lines; mouth small, oblique; upper part of the tube oblique, deeply indented or Balaniform, and coarsely striated longitudinally. Length 8 inches.

Locality.—Monterey Co., California. A. S. Taylor. Growing in clusters like *Balani*. No sutures, indicating separate valves; cells very thin plates, convex surface downwards.

Echinoderms.

ASTRODAPSIS, Conrad.

Suboval, depressed; ambulacral areas elevated or ridged; ambulacra nearly straight, widely open at the extremity; mouth central; anus submarginal, beneath; radiating grooves as in *LAGARTUM*.

Astrodapsis Antuelli. Pentangular, suboval; ambulacral ridges rounded on the back, straight and oblique on the sides; interambulacral areas profoundly depressed, angulated in the middle; point of divergence of the ambulacra depressed below the level of the ridges, not quite central, but anterior to the middle; anus small, almost marginal. Length $\frac{1}{2}$ inch.

Locality.—Monterey Co., Cal. A. S. Taylor.

MELLITA, Klein.

Mellita Tezana. Suborbicular; very wide anterior to the middle; ambulacra moderately curved, nearly closed; lunules 5, moderately wide.

Locality.—Texas. Dr. Francis Moore.

Form of *M. testinata*, Klein, but the ambulacra are proportionally longer and narrower, and the middle lunule much shorter. (A tertiary fossil.)

Catalogue of Birds collected at Cape Lopez, Western Africa, by Mr. P. B. DuChaillu, in 1856, with notes and descriptions of new species.

By JOHN CASSIN.

During some months passed at Cape Lopez, in which Mr. DuChaillu made the present collection of birds and collections of great interest in other departments, his researches extended to a distance of about sixty miles from the coast. The larger part was, however, collected in the immediate vicinity of Cape Lopez.

Latterly Mr. DuChaillu has not sent in his collections specimens of common birds previously transmitted. This fact will account for omissions of well-known species in the present catalogue.

1. GYPOHIERAX ANGOLENSIS, (Gmelin.)

Falco angolensis, Gm. Syst. Nat. i. p. 252, (1788.)

Gray's Genera, i. pl. 4. Jard. & Sel. Ill. Orn. N. S. pl. 13.

Young ♂. Entire plumage pale fuscous, very light on the throat and abdomen, and nearly white on the occiput. Quills and tail brownish black, bill and tarsi greenish yellow.

This is the only specimen of the young of *Gypohierax* that has ever come under our notice, though we have frequently seen the adult. In this specimen the pale brown represented in Jard. and Selby Ill., as cited above, extends to the entire body and head, the occiput only being nearly white. It has attained the size of maturity.

2. LANIUS SMITHII, Fraser.

Lanius Smithii, Fraser, Proc. Zool. Soc., London, 1843, p. 16.

Specimens of both sexes, which are very similar, the females being only slightly lighter in color.

3. LANIARIUS PELI, (Bonaparte.)

Malaconotus Peli, Bonap. Consp. Av. p. 360, (1850.)

Laniarius lepidus, Cassin, Proc. Acad. Philada., vii. p. 327, (1855.)

This appears to be a species of frequent occurrence in equatorial Africa.

We committed the indiscretion of describing and naming this bird, not being able to recognize it from the short description in Bonaparte's Consp. as above, which is comprised in exactly eleven words. The only use of such descriptions is, that they answer for a sort of *caveat* to all other naturalists against describing any species at all similar; and to such extent is this obscure and absurd style persisted in by a few European ornithologists, that there are now about enough irreco gnizable descriptions published to cover all possible birds that may be discovered for some time to come.

For the means of determining this species we are indebted to that accomplished and accurate ornithologist Dr. Hartlaub, of Bremen, whose description is in Cabanis' Journal, 1855, p. 358.

4. TEPHRODORNIS OCREATUS, Strickland.

Tephrodornis ocreatus, Strickl., Proc. Zool. Soc., London, 1844, p. 102.

Fraser, Zool. Typ. pl. 36.

Several specimens, which are almost precisely as figured by Fraser as above, and though all have a general aspect of immaturity, yet are very nearly alike. The females have rather more of the black edgings on the breast and throat, and are slightly smaller. The integral character of the scales of the *tarsi* holds

good in all these specimens, and is a very curious character, the *tarsus* having apparently but a single scale in front and another on each side.

5. *MUSCIPETA FLAVIVENTRIS*, Verreaux.

Muscipeta flaviventris, Verr. Cab. Jour., 1855, p. 103.

One of the most beautiful species of this group and having the under parts of a rich orange color, quite peculiar. The adult male is described by M. Verreaux; the female is smaller and of lighter colors, back and throat approaching bluish cinereous, under parts nearly as in the male.

6. *PLATYSTIRA MELANOPTERA*, (Gmelin.)

Muscicapa melanoptera, Gm. Syst. Nat. p. 939, (1788.)

Jard. & Sel. Ill. pl. 9.

Not to be distinguished from specimens obtained at more northern localities on the coast.

7. *ARTOMYIAS FULIGINOSA*, Verreaux.

Artomyias fuliginosa, Verreaux, Cabanis' Jour., 1855, p. 104, (March.)

Butalis infuscatus, Cassin, Proc. Acad. Phila., vii. p. 328, (April, 1855.)

The adult is described by M. Verreaux and myself as above. The young is of the same general colors, but with the abdomen, rump and wing coverts thickly spotted with white, which predominates in the middle of the abdomen, and marks the tips of the wing coverts.

This is a most singular form of *Muscicapa*, and so nearly approaching the general characters of *Hirundo*, that although specimens have been in my possession for nearly twenty years, I never felt fully assured that it was not an obscure style of *Cotyle*, until informed by Mr. DuChailu that it is strictly a Fly-catcher in its habits. It was first sent by Dr. MacDowell from St. Paul's River.

8. *PRATINCOLA SALAX*, Verreaux.

Pratincola salax, Verreaux, Rev. et Mag. Zool., 1851, p. 307.

Messrs. Verreaux describe the male of this handsome species. Specimens marked as females in Mr. DuChailu's collection have the upper parts grayish, with obscure longitudinal stripes of dark brown. Throat gray, breast and flanks dull chestnut, abdomen and rump white.

9. *MACRONYX FLAVIVENTRIS*, Swainson.

Macronyx flaviventris, Sw. B. of W. Af. i. p. 215.

Jard. & Selby, Ill. Ogm. N. S. pl. 22.

In mature plumage and very nearly as described and figured above. *Alauda crocea*, Vieill. is a very distinct affair and not much like the present bird.

10. *ANTHUS GOULDII*, Fraser.

Anthus Gouldii, Fras. Proc. Zool. Soc., London, 1843, p. 27.

Plenty of specimens and all of one species, but not clearly recognizable from Fraser's description. They are, however, obscurely marked, but about the size and general style as described.

11. *ANDROPADUS LATIROSTRIS*, Strickland.

Andropadus latirostris, Strickl. Proc. Zool. Soc., 1844, p. 100.

Numerous specimens. There are not, however, in the present collection any specimens of the allied but quite distinct species *A. gracilirostris*, Strickl., though both are in collections formerly received from the river Moondah.

12. *TRICOPHORUS CALURUS*, Cassin.

Tricophorus calurus, Cassin, Proc. Acad. Philada., viii. p. 158, (1856.)

Specimens presenting no characters other than as described.

13. *TRICOPHORUS NOTATUS*, Cassin.

Tricophorus notatus, Cassin, Proc. Acad. Philada., viii. p. 158, (1856.)

Precisely similar to specimens originally described by me.

14. *SYNCOPTA TINCTA*, Cassin.

Syncopta tincta, Cassin, Proc. Acad. Philada., vii. p. 325, (1855.)
In plumage exactly the same as the original specimens.

10. *SYLVETTA MICROURA*, (Rüppel.)

Troglodytes micrurus, Rüpp., Neue Wirb. Abyss. pl. 41, fig. 2.
Much like the figure as cited and very probably identical.

16. *CISTICOLA CURSITANS*, (Franklin.)

Prinia cursitans, Frank., Proc. Zool. Soc., London, 1831, p. 118.
"Cisticola oryzicola, Temm., ex Borneo." Label on spec. from Leyden Museum.

Jard. Ill. Ind. Orn. pl. 6.

Not distinguishable from India specimens, and we may add, scarcely from European *Sylvia cisticola*. The first that I have seen from Africa.

17. *DRYMOICA*, Swainson.

Specimens of two species in the present collection I cannot refer to known Western African species of this genus, but must defer naming them until my leisure will allow a full examination of the group.

18. *SERMESTES CUCULLATA*, Swainson.

Spermestes cucullata, Sw. B. of W. Af. i. p. 201.

Von Müller Beitr. Orn. Afr. pl. 16.

Specimens labelled as adults of both sexes are very similar, but the young are quite different. The entire plumage is dull brown, like the back of the adult, tinged with ashy on the lower parts, and nearly white in the middle of the abdomen. Not a vestige of the glossy metallic tints of the head, breast and sides of the adult.

The Baron Von Müller gives very handsome figures of adults, as above.

19. *ORTYGOSPIZA ATRICOLLIS*, (Vieillot.)

Fringilla atricollis, Vieill. Nouv. Dict. xii. p. 182, (1817.)

Fringilla polyzona, Temm.?

Temm. pl. col. 221, fig. 3?

Specimens in the present collection agree with the description of Vieillot, but though apparently in adult plumage, have no white on the throat nor around the eyes in either sex. I have also before me seven specimens of the true *O. polyzona* from "Gambia," in which this character is present. In other respects the two are very similar.

Females have the throat pale cinereous, not black as in the male.

20. *ESTRELLA MELPODA*, (Vieillot.)

Fringilla melpoda, Vieill., Ency. Meth. p. 987.

Vieill. Ois. Ch. pl. 7.

Beautiful specimens of both species. The female only differs from the male in being lighter colored.

21. *FRINGILLARIA TAHAPISI*, (Smith.)

"*Emberiza tahapisi*, Smith, Rep. of S. Af. Exp."

Two specimens which are the first appearance of this species in the fauna of Western Africa. Not having access to the description by Dr. Smith, I apply this name on the faith of that accurate ornithologist Mr. Jules Verreaux, who presented specimens from South Africa to the Museum of this Academy. Those specimens are strictly identical with the present, and are labelled by Mr. Verreaux "type de Smith."

22. *SYCOBIUS NIGERRIMUS*, (Vieillot.)

Ploceus nigerrimus, Vieill. Ency. Meth. p. 700.

Ploceus niger, Swains, Cab. Cy. Menag. p. 366.

Specimens labelled by Mr. DuChaillu as both sexes of this little-known species are entirely black, and differ only slightly in size and lustre of plumage. The young are however very different, having the upper parts dark green with lon-

gitudinal stripes of brown and black, under parts dull yellow darker on the sides, wings and tail in some specimens brown, in others black. Bill lighter colored than in the adult, under mandible nearly white. In young plumage this bird might readily be mistaken for a distinct species.

23. *SYCORIUS MALIMBUS*. (Temminck.)

Textor malimbos, Temm.

Malimbos cristatus, Vieill. (♀)

Sycobius rubricollis, Sw. An. Menag. p. 306.

Euplectus rufovelatus, Fraser, Proc. Zool. Soc. London, 1842 p. 42? Vieill. Ois. Chant. pl. 43. Fras. Zool. Typ. pl. 46?

I have at this moment specimens before me of all known species of *Sycobius* as given by late ornithologists, but am not without difficulty in referring a single specimen in the present collection to either of them. It has a large occipital spot or band of bright scarlet extending somewhat to the sides of the neck. Front and cheeks fully including and above the eyes and all other parts of the plumage fine lustrous black.

The present specimen is exactly of the size of Vieillot's figure cited above, but too small for that of Fraser, though in color resembling the head in the second figure of his plate. I have no doubt that it is the bird represented by Vieillot though perhaps not in adult plumage, but I have doubts of its being Fraser's bird, and also of the supposed identity of the two. A fine specimen of *S. rufovelatus* now before me is larger, with the bill straighter and thicker, and very nearly as represented in Fraser's plate.

In the present bird the front to the eyes is lustrous black. I regard it as *S. malimbos* in a stage of plumage analogous to that represented by Fraser in the second figure of his plate.

24. *HYPHANTORNIS FLAVIGULA*, Hartlaub.

Hyphantornis flavigula, Hartl. Rev. Zool. 1845, p. 406.

Hyphantornis Grayi, Verreaux Rev. et Mag. Zool. 1851, p. 514.

In numerous specimens received from Mr. DuChailu, the above are invariably labelled as males and females of the same species.

25. *COLIOSTRYTHUS MACROURUS*, (Gmelin.)

Lovia macroura, Gm. Syst. Nat. i. p. 845, (1788.)

Fringilla flavoptera, Vieill.

Vidua chrysonota, Sw. B. of W. Af. i. p. 178.

Buff. Pl. Ent. 183, fig. 1. Vieill. Ois. Chant. pl. 41.

In beautiful plumage. This is the most southern locality that I have ever seen for this species.

26. *CORYTHAIX PERSA*, (Linnaeus.)

Cuculus persa, Linn. Syst. Nat. i. p. 171, (1766.)

Edwards' Birds, pl. 7.

The species with a crest having red tips. Apparently common in Equatorial Africa.

27. *TOCOTUS FASCIATUS*, (Shaw.)

Buceros fasciatus, Shaw.

Le Vaill. B. of Af. pl. 233.

Several specimens of the real *T. fasciatus*, with the second and third feathers of the tail pure white, though the first and those of the middle are black. In the young bird the tips only of the two feathers are white. *T. semifasciatus*, Temm. 'Cabanis' Jour. 1855, p. 356, is very much like the present bird in young plumage, but a specimen now before me (of *T. semifasciatus*) from the Rivoli collection is considerably larger and has a mature appearance.

28. *TOCOTUS CAMERUS*, nobis.

The smallest known bird of this group. Allied to, and somewhat resembling *T. melanoleucus* (Le Vaill. Ois. d'Af. pl. 234). Bill greatly compressed, with a

sharp slightly raised culmen, curved. Wing short, fifth and sixth quills longest; tail rather long.

Total length about $13\frac{1}{2}$ inches, wing 6, tail $6\frac{1}{2}$ inches.

Bill red. Entire upper parts, throat and breast amber brown, strongly tinged with fulvous on the rump, and with greenish bronze on the wings and tail. Wing coverts tipped with white, forming two conspicuous bars diagonally crossing the wing. Primaries with a single spot of pale fulvous on each web, larger on the inner, tertiaries edged with pale fulvous on both webs. Under parts from the breast white, tinged with cinereous on the sides. Tail amber brown, with a greenish bronzed lustre, tipped with white, shafts of tail feathers above yellowish white inclining to golden; below white. Legs dark.

Hab. Cape Lopez, Western Africa. Discovered by Mr. P. B. DuChailu.

This is the smallest bird of the genera *Buceros* and *Tockus* that I have ever seen, and appears to be the smallest known species. It resembles in some measure *T. melanoleucus* as above mentioned, but is much smaller. Three specimens are in the collection, essentially alike.

29. *HALCYON SENEGALENSIS*, (Linnæus.)

Alcedo senegalensis, Linn. Syst. Nat. i. p. 180, (1766.)

Swains. Zool. Ill. pl. 27.

Not to be distinguished from specimens obtained at more northern localities.

30. *CAPRIMULGUS BINOTATUS*, Temminck.

Caprimulgus binotatus, Temm. Cabanis' Jour. 1855, p. 355.

The only species of this group that has been received from the Gaboon country. It appears to be this species and is a true *Caprimulgus* allied to *C. pectoralis*, Cuvier, *C. poliocephalus*, Rüppel and others.

31. *ANTHREPTES FRASERI*, Jardine.

Anthreptes Frazeri, Jard. Ill. Orn. n. s. p. pl. 52.

A single specimen very nearly as described and figured above, but having some appearance of immaturity.

32. *NECTARINIA CUPREA*, (Shaw.)

Certhia cuprea, Shaw.

Cinnyris erythronotus, Sw. B. of W. Af. ii. p. 30, pl. 15.

Vieill. Ois. dor. pl. 27.

Numerous specimens. The female and young are dull yellowish green above, and dull yellow beneath; totally unlike the male in plumage.

33. *NECTARINIA CYANOCEPHALA*, (Vieill.)

Certhia cyanocephala, Vieill.

Cinnyris chloronotus, Sw. B. of W. Af. ii. p. 136, pl. 16.

Vieill. Ois. dor. pl. 7, 25. Jardine Mon. pl. 10.

Apparently a common species at Cape Lopez.

34. *CENTROPUS MONACHUS*, Rüppell.

Centropus monachus, Rüpp. Faun. Abyss. pl. 21.

A single specimen strictly identical with specimens in the Academy Museum from Mr. Rüppell's collection. Larger than *C. senegalensis*.

35. *MEROPS BICOLOR*, Daudin.

Merops bicolor, Daud. Ann. du Mus. ii. pl. 440, pl. 62, fig 1.

Merops malimbis, Shaw Nat. Misc. pl. 701.

Vieill. Gal. i. pl. 186. Le Vaill. Guep. pl. 5.

Apparently abundant in Equatorial Africa.

36. *MEROPS BULLOCKIODES*, A. Smith.

Merops Bullockioides, A. Smith, S. Af. Quar. Jour. 1834.

Smith, Ill. Zool. S. Af. Aves, pl. 9.

Several specimens of both sexes are in the collection.

37. *MEROPS VARIEGATUS*, Vieillot.
Merops variegatus, Vieill. Ency. Meth. p. 390.
Merops cyanipectus, Verreaux, Rev. et Mag. Zool., 1851, p. 269
 Le Vaill. Guép. pl. 7.
 Numerous specimens.
38. *DENDROBATES CAROLI*, (Malherbe.)
Chloropicus Caroli, Malh. Rev. et Mag. Zool. 1852, p. 550.
 Numerous specimens.
39. *POGONIAS HIRSBUTUS*, Swainson.
Pogonias hirsutus, Sw. Zool. Ill. II. pl. 72.
40. *OXYLOPHUS JACOBINUS*, (Boddaert.)
Cuculus jacobinus, Bodd. Tab. Pl. Enl.
Cuculus serratus, Sparrm. Mus. Carls.
Cuculus ater, Gm. Syst. Nat. I. p. 415.
 Sparrm. Mus. Carls. pl. 3. Lev. Ois d'Af. pl. 207, 208.
 The *debut* of this species in the fauna of Western Africa. One specimen only, which is probably a female, having the under parts dull ashy white. It is quite identical with specimens from Southern Africa in the museum of the Academy.
41. *TARBON CALVA*, (Temminck.)
Columba calva, Temm. Knip and Prev. Pigeons, II. pl. 7.
42. *PERISTERA CHALCOSPILUS*, (Wagler.)
Columba chalcospilos, Wagler. Rupp. Syst. Uebers. pl. 38. Buff. pl. Ent. 160.
43. *PERISTERA PUELLA*, Schlegel.
Peristera puella, Schlegel. Beydrag. Dierk. I. p. 17, pl. 6, (1848.)
 One of the most beautiful of the Doves of Africa. Our specimens are precisely as given in the highly valuable work above cited.
44. *FRANCOLINUS LATHAMI*, Hartlaub.
Francolinus Lathamii, Hartl. Cab. Jour. 1855, p. 210.
 "Francolinus Peli, Temm." Label on specimen from Leyden Museum.
 Leona Partridge, Lath. Gen. Hist. VIII. p. 273.
 A very handsome species well described by Latham. This bird belongs strictly to the same group as *Coturnix histriónica*, Hartlaub, and bears a general resemblance to that species, but is quite distinct. Sexes nearly alike, the female having the white spots of the under parts larger.
45. *FRANCOLINUS SQUAMATUS*, nobis.
 About the size of and belonging to the same group as *F. nudipectus* and *F. natalensis*. Bill rather strong, sixth quill longest; tertiaries longer than primaries; upper tail coverts long; legs stout; tarsus in the male with one short, sharp spur. Total length about 14 inches; wing $7\frac{1}{2}$; tail $3\frac{1}{2}$ inches. Entire upper parts dark reddish brown, unspotted on the head, variegated with dull reddish white on the back, and with irregular transverse stripes of black on the back, rump and wings. Feathers of the neck edged with ashy white. Entire under parts brownish cinereous with a tinge of fulvous, every feather large and having a dark brown shaft, and conspicuously edged with the same color. Throat paler, breast darker. Upper mandible dark bluish, under mandible red, feet red. Under tail coverts dark reddish brown. Female smaller.
 With a large collection before me, including very nearly all the species of Dr. Smith, I have failed to recognize this bird as a described species. The present specimens are the first that I have ever seen. The large and scale-like character of the plumage of the under parts is quite peculiar.
46. *NUMIDA PLUMIFERA*, nobis.
 Of the same subgeneric group (*Guttera*) as *N. cristata*, and bearing a general resemblance to that species. Head above with an ample crest of straight, erect, narrow feathers; occiput, throat and upper part of neck covered with short

downy feathers in the male, naked in the female. Bill rather stout; rictal membrane small; fourth and fifth quills longest; tertiaries longer than primaries; upper and under tail coverts ample and long; legs stout. Total length about 16½ inches; wing 9; tail 5 inches.

Colors generally resembling those of *N. cristata*, but without the black of the neck and breast of that species. Crest in both sexes and downy plumage of the head in the male black; secondary quills with their outer webs yellowish white; tertiaries with narrow longitudinal stripes of bluish white on their outer and exposed webs. All other parts of the plumage above and below (including the neck and breast) bluish black or slate color, with numerous circular spots of bluish white rather larger on the neck. Bill bluish, lighter at the tip, legs bluish. Female similar to the male, but with the white spots rather larger on the neck; naked skin of the head dark, (naked in the female only.)

This interesting addition to African Ornithology is strictly of the same group as *Numida cristata*, Pallas, Spic. Zool. pl. 2, but is readily to be distinguished by its erect crest, which is peculiar, and the absence of the black neck and breast of that species. The white spots on all parts of the body are smaller than in *N. cristata*, and extend to the neck, breast and tibiae, which in that species are black. Specimens of both sexes are in the collection.

Genus PHASIDUS.

Allied to *Numida*, Linn. and to *Agelastus*, Temm. Bill strong, curved, rather wide and rounded at the tip; wing moderate; fifth and sixth primaries longest; tertiaries longer than primaries; tail moderate; tarsus stout, with large, somewhat rounded or hexagonal scales in front; toes rather long, claws long, stout. Head naked, except a longitudinal stripe on the top of the head.

47. PHASIDUS NIGER, nobis.

Head and throat naked, but with a longitudinal stripe of short black feathers from the base of the bill to the occiput, ending abruptly. Neck before and throat with a few short black feathers, behind and below the bare space densely covered with short black feathers.

Entire plumage black, very obscurely punctated and vermiculated, with a lighter shade on the upper parts and lighter on the middle of the abdomen. Bill corneous, with the edges of the mandibles nearly white; legs and toes dark corneous. Naked space on the head probably yellow or light red. Male.

Total length about 17 inches; wing 8; tail 6 inches.

This is the most remarkable bird yet discovered by Mr. DuChaillu. It belongs to the same group as *Numida* and *Agelastus*, but is more intimately allied to the latter, of which the only known form is *Agelastus meleagrides*, Temm. Cabanis' Jour. 1855, p. 356, and for a fine specimen of which this Academy is indebted to the liberality of the distinguished naturalist by whom it was first introduced to the notice of ornithologists.

A single specimen, labelled as a male, is in the collection, and is from a few miles in the interior, at Cape Lopez. The general appearance of this bird is not unlike that of *Gallophasis purpureus*, Gray, but is generically distinct.

48. HIATICULA PECUARIA, (Temminck.)

Obaradrius pecuarius, Temm. Pl. Col. v. pl. 183.

Identical with South African specimens in the Academy's Museum.

49. NYCTICORAX EUROPEUS, Stephens.

Nycticorax europæus, Steph. Gould B. of Eur. pl. 279.

A single specimen in very mature plumage. Rather lighter in color than specimens from Europe, and with the white of the front extending over and behind the eye.

The Committee on Proceedings presented a Special Report, which was adopted.

The Corresponding Secretary read his Report for last month.

The Recording Secretary presented the following

ANNUAL REPORT FOR 1856.

During the past year, December 1, 1855, to November 30th, 1856, there have been elected thirty-one Members and ten Correspondents.

Six Members have died, to wit: Mr. Thomas Fisher, Isaac A. Pennypacker, M. D., Mr. Jonathan Edwards Taggart, Madison Rush, late U. S. Navy, Mr. Samuel B. Ashmead, and Edmund Lang, M. D.

During the same period the following Papers have been presented to the Academy for publication in the Journal or Proceedings:—

By the Reverend M. J. Berkeley and the Reverend M. A. Curtis. "A Commentary on the 'Synopsis Fungorum in America Boreali Media Degentium.' By L. De Schweinitz." Published in the Journal.

By John Cassin, four, to wit: "Notices of some new and little-known Birds in the collection of the U. S. Exploring Expedition in the Vincennes and Peacock, and in the Museum of the Academy of Natural Sciences of Philadelphia;" "Notes on North American Birds in the collection of the Academy of Natural Sciences of Philadelphia;" "Descriptions of new species of African Birds in the Museum of the Academy of Natural Sciences of Philadelphia, collected by Mr. P. B. DuChailu, in Equatorial Africa;" "Descriptions of new species of Birds in the National Museum, Washington, and in the Museum of the Academy of Natural Sciences of Philadelphia."

By T. A. Conrad, two, to wit: "Notes on the Miocene and Post-pliocene Deposits of California, with descriptions of two new fossil corals;" "Description of a new species of *Pentamerus*."

By James Deane, M. D. "On the Sandstone Fossils of the Connecticut river." Published in the Journal.

By Elias Durand. "Plantæ Kaneanæ Arcticæ et Polares." Published in the Journal.

By Charles Girard, M. D., four, to wit: "Contributions to the Ichthyology of the Western Coast of the United States;" "On a new genus and species of *Urodela*;" "Researches upon the Cyprinoid Fishes inhabiting the fresh waters of the United States of America, west of the Mississippi Valley;" "Notice upon the species of the genus *Salmo*, of authors."

By Edward Hallowell, M. D., seven, to wit: "On a new species of *Ambystoma* from Lake Superior;" "Descriptions of two new *Urodeles* from Georgia;" "Notes on the Reptiles in the collection of the Academy of Natural Sciences of Philadelphia;" "On several new Reptiles in the collection of the Academy of Natural Sciences of Philadelphia;" "Notes on the Reptiles in the collection of the Academy of Natural Sciences of Philadelphia;" "Notice of a collection of Reptiles from Kansas and Nebraska;" "On a new and remarkable genus of *Ranidae* from the river Parana."

By L. Harper. "*Ceratites Americanus*."

By Rufus Haymond, M. D. "Birds of Southern Indiana."

By Thomas P. James. "An enumeration of Mosses detected in the Northern United States, which are not comprised in Gray's Manual."

By Robert Kennicott. "Description of a new Snake from Illinois."

By Isaac Lea, LL. D., nine, to wit: "Description of new fresh water shells of California;" "Description of a new species of *Triqueta*;" "Description of a new genus of *Naiades*;" "Description of twenty-five species of *Exotic Unios*;" "Description of four new species of *Exotic Unios*;" "Description of thirteen species of *Exotic Periotoma*;" "Description of fifteen new species of *Melania*;" "On the *Byssus* in the genus *Unio*;" "Description of eleven new species of *Uniones* from Georgia."

By Major John LeConte, four, to wit: "Observations on the North American Bats;" "Descriptive Catalogue of the Ranina of the United States;" "Description of two new species of *Hesperomys*;" "New species of *Hyla*."

By John L. LeConte, M. D., six, to wit: "Synopsis of the Mycetophagidae of the United States;" "Synopsis of the Phalacridae of the United States;" "Note on the genus *Lithodus* of Schöenherr;" "Notice of three genera of Scarabæidae in the United States;" "Analytical Table of the species of *Chlæneus* found in the United States;" "Synopsis of the Melolonthidae of the United States." Published in the Journal.

By Joseph Leidy, M. D., sixteen, to wit: "Notices of some Tape Worms;" "Descriptions of two new *Ichthyodorulites*;" "A synopsis of Entozoa and some of their Ecto-congeners observed by the Author;" "Notice of some Remains of extinct Mammalia recently discovered by Dr. F. V. Hayden in the 'bad lands' of Nebraska;" two papers; "Description of some Remains of Fishes from the Carboniferous and Devonian Formations of the United States;" published in the Journal. "Description of some remains of Extinct Mammalia;" published in the Journal. "Notices of remains of extinct Fishes and Reptiles discovered by Dr. F. V. Hayden, etc.;" "Notices of three extinct Fishes;" "Notice of the remains of a species of Seal from the Post-pliocene deposit of the Ottawa river;" "Notices of several genera of extinct Mammalia, previously less perfectly characterized;" "Notice of some remains of extinct Vertebrated Animals;" "Notices of extinct Vertebrated Animals of New Jersey, etc.;" "Notices of remains of extinct Vertebrated Animals discovered by Prof. E. Emmons;" "Notices of some remains of fishes discovered by John E. Emory;" "Notices of remains of two species of seal."

By F. B. Meek and F. V. Hayden, M. D., four, to wit: "Descriptions of thirty new species of Gasteropoda from the Cretaceous formation of Nebraska Territory;" "Descriptions of new species of Gasteropoda and Cephalopoda from the Cretaceous formation of Nebraska Territory;" "Descriptions of thirty new species of Accephala and Gasteropoda from the Cretaceous Formation of Nebraska Territory;" "Descriptions of new species of Accephala and Gasteropoda, from the Tertiary Formation of Nebraska Territory;" "Descriptions of new fossil species of Mollusca collected by Dr. F. V. Hayden in Nebraska Territory."

By James Aitken Meigs, M. D. "Catalogue of Human Crania in the collection of the late Samuel George Morton, M. D., etc."

By J. S. Newberry, M. D. "Descriptions of several new genera and species of Fossil Fishes, from the Carboniferous Strata of Ohio."

By W. F. Rogers. "Synopsis of the *Chrysomela* and allied genera inhabiting the United States."

By Abraham Sager. "Descriptions of Myriapoda, supposed to be new."

By Phillip Lutley Slater, two, to wit: "Description of a new species of *Tanager* of the genus *Saltator*;" "Characteristics of an apparently undescribed Bird belonging to the genus *Spix*, etc."

By B. F. Shumard, M. D., and L. P. Yandell, M. D. "Notice of a new fossil genus belonging to the Family *Blastoidea*, from the Devonian Strata near Louisville, Ky."

By W. J. Taylor. "Examination of Meteoric Iron, from Xiquipilco, Mexico."

In all seventy-three.

All of which is respectfully submitted by

B. HOWARD RAND, M. D.,

Recording Secretary.

Dec. 30th, 1856.

The following Report of the Librarian was read and adopted .

LIBRARIAN'S REPORT FOR 1856.

The additions to the Library of the Academy during the current year amount to 1,449, of which number 295 are complete volumes, and 1,154 are pamphlets, scientific periodicals, &c. The sources whence these books have been obtained, and the general subjects upon which they treat, are presented in the following table :

SUBJECTS.	From Dr. T. B. Wilson.		From Mr. E. Wilson.		From Authors Editors, Mem- bers, &c.,		From Socie- ties, &c.,		Total.	
	Vols.	Pamph.	Vols.	Pamph.	Vols.	Pamph.	Vols.	Pamph.	Vols.	Pamph.
Journals, Transactions, Pro- ceedings, Memoirs, &c.,	18	207			6	62	54	151	78	280
Natural Sciences,	89	254	8	25	38	77	2	1	129	267
Anatomy and Physiology,	12	5	2	182	2	4			16	184
Physics and Chemistry,	1	1	3	10	2	2	1	1	7	13
General Natural History,	12	7		4	1	1			12	12
Ethnology and Languages,	3	2		2			1		4	6
Voyages, Maps, &c.,	17								17	
Miscellaneous,	8	4	8	47	12	18	6	2	31	71
Total,									295	1154

By referring to the last Report of the late Librarian, Dr. W. S. Zantsinger, it will be seen that the total increase for the present year exceeds that for 1855 by 592. In December last, Dr. Z. estimated that the Library contained about 15,500 volumes, tracts, periodicals, serials, &c. By the additions for 1856, this number has been swelled to 16,949.

Respectfully submitted by

J. AITKEN MEES, Librarian.

Dec. 30th, 1856.

The Curators presented their Annual Report which was read, adopted and referred to the Committee on Proceedings.

REPORT OF THE CURATORS FOR 1856.

The Curators take pleasure in reporting that the Museum of the Academy is in an excellent condition of preservation, and that it has received valuable accessions to all its departments during the year just about closing.

Since the last annual report was presented to the Academy, the arrangement of the Ichthyological collection has been undertaken by Drs. R. E. Bridges and J. Cheston Morris; and W. J. Binney, Esq. has commenced the arrangement of the Conchological collection. The collection of Birds continues to be arranged by Dr. T. B. Wilson. The collections of Minerals, Crustacea, Insects, and Fossil plants have been arranged prior to this year as stated in previous reports. No department is perhaps better arranged than that of the Herpetological collection, for which the Academy is indebted to the information and seal of Dr. E. Hallowell. The collection of Vertebrate Remains has been recently arranged by Dr. J. Leidy. Mr. E. Durand has made considerable progress in the formation of an American Herbarium, which he informs us will be of a very complete character. In several departments, the Academy yet needs some assistance before the Museum shall be completely arranged, more especially in the departments of Mammalogy, Invertebrate Palaeontology, and Geology.

During the year 1856, the donations to the different departments of the Museum have been as follows:—

Mammals.—Of these 33 specimens of 14 species have been added to the collection; and among them is a fine specimen of the Musk Ox, deposited by Dr. E. K. Kane, and one of the Walrus, presented by Sandwich Drinker, Esq.

Birds.—W. S. Wilson, Esq. presented 146 specimens of 129 species of Birds ; and 30 specimens of 16 species were presented by others.

Reptiles.—Dr. W. S. Hammond, U. S. A., presented 100 specimens of 40 species of Reptiles from Kansas and Nebraska ; and Dr. A. Heermann presented 70 specimens of 30 species from Texas. Besides these collections, there have been received 415 specimens of 140 species through donation and exchange. Among the chief donors are Drs. Miles, Hallowell and Uhler, and Major LeConte.

Fishes.—Of these about 100 specimens of 48 species have been presented, chiefly by Dr. Watson, Mr. Ashmead, and Dr. Leidy.

Mollusks.—Of these about 800 specimens of 350 species have been presented. Among them are 100 species of the rarer marine shells of the United States coast, presented by Wm. Stimpson, Esq. ; and 111 species of *Achatinella*, from the Sandwich Islands, presented by Dr. W. Newcomb, of Albany. The donors of the others are chiefly F. A. Sauvalle, of Cuba, Dr. T. J. Turner, U. S. N., Mr. Binney, and Mr. Ashmead.

Insects.—Dr. T. B. Wilson presented 2400 specimens of 900 species of Coleoptera ; Mr. Guex 1500 of 356 species of the same order ; and G. J. Barnett, Esq. 700 of 80 species. Besides these there were presented several small collections of Coleoptera, Neuroptera, and Lepidoptera.

Crustaceans, Arachnides, Myriapods, Annelides, and Zoophytes.—Of Crustaceans 358 specimens of 65 species have been presented, chiefly by W. S. Wilson, Mr. Ashmead, and Dr. Davidson ; of Arachnides 8 specimens of 4 species have been presented ; of Annelides 3 specimens of 2 species ; and of Zoophytes 104 specimens of 40 species, chiefly from Mr. Ashmead.

Comparative Anatomy.—Of skeletons there have been received 9, among which are those of the Polar Bear and the Delphinapterus, presented by Dr. E. K. Kane. Of human skulls 21 have been received through Drs. McClellan, Ruschenberger, Kane and Mitchell, and Mr. Richard Harlan. Of other skulls 6 have been presented, chiefly by W. W. Wood, Esq.

Botany.—Collections of plants have been presented by Mr. Tuckerman, Dr. Kane, Mr. Eckert and Dr. Wilson. Mr. C. E. Smith presented 500 species ; Sir W. Hooker 158 Himalaya species, and Mr. Ashmead 66 species of Marine Algæ. Besides these there have been received 16 species of fruits, &c.

Palæontology.—Of Vertebrate remains 40 specimens have been presented by Dr. S. W. Clanton ; a collection of bones of the *Megalonyx*, from Alabama, by Prof. Tuomey, and 130 specimens from various donors. Besides these Mr. Richard Harlan has presented numerous moulds and casts of remains of *Palmæotherium*, *Deinotherium*, *Megalosaurus*, &c. from the collection of his father, Dr. Harlan. Of Invertebrate remains 80 specimens were presented ; and of Fossil plants 38 specimens, the latter being chiefly from Mr. Schæffer and W. F. Rogers.

Mineralogy.—Of Minerals 98 specimens were presented, among which the most interesting is a specimen, over 16 lbs in weight, of Cinnabar, from the Almadin mines of California, from Capt. J. Henry Smith.

Respectfully submitted by

JOSEPH LEIDY,
Chairman of the Curators.

The Treasurer read his Annual Report, which was referred to the Auditors.

The Report of the Publication Committee was deferred until the next meeting for business.

The Academy then went into an election for Officers and a Publication Committee for the ensuing year (1857.) The following named gentlemen were announced as duly elected :—

<i>President,</i>	-	-	-	-	-	GEORGE ORD.
<i>Vice Presidents,</i>	-	-	-	-	-	Robert Bridges, M.D. Isaac Lea, LL.D.
<i>Corresponding Secretary,</i>	-	-	-	-	-	John L. LeConte, M.D.
<i>Recording Secretary,</i>	-	-	-	-	-	B. Howard Rand, M.D.
<i>Librarian,</i>	-	-	-	-	-	J. Aitken Meigs, M.D.
<i>Treasurer,</i>	-	-	-	-	-	George W. Carpenter.
<i>Curators,</i>	-	-	-	-	-	Joseph Leidy, M.D. William S. Vaux, Samuel Ashmead, John Cassin.
<i>Auditors,</i>	-	-	-	-	-	William S. Vaux, Samuel Ashmead, Robert Pearsall,
<i>Publication Committee,</i>	-	-	-	-	-	William S. Vaux, Robert Bridges, Isaac Lea, H. Cooper Hanson, Joseph Leidy.

ELECTION.

Prof. Henry Coppée, Thomas Dunlap, Esq., Louis de Vesey, U. S. A., Prof. Samuel D. Gross, and Dr. Alexander Hamilton Smith, were elected members of the Academy.

DONATIONS TO MUSEUM

IN JANUARY AND FEBRUARY, 1856.

January 1st.

Several specimens of black band iron ore, from Scotland. From Dr. Wilson.
 Mounted specimen of *Talpa warouza*, from Japan. From Major Le Conte.
 Specimen of sulphuret of iron, Schuylkill Co., Pa. From Robert W. Kennedy.
 Fossil Encrinurite, from near Capon Springs, Va. From Mr. A. H. Smith.
 Portion of reed encrusted with carbonate of lime, from Lago di Tartara, Italy.
 From the same.

One hundred and fifty-eight species of plants from the Himalayas. Presented by Sir Wm. Hooker through Prof. Asa Gray.

January 8th.

Two specimens of *Fiber zibethicus*. Presented by Aubrey H. Smith, Esq.
 Five specimens of *Mygale* ——— ? S. America. Presented by C. Gillou, Esq.
Astrangia astræiformis, from coast of Rhode Island. From Duncan E. Pell, Esq., through Mr. Powell.

Hesperomys leucopus, (numerous specimens,) from Massachusetts. Presented by Smithsonian Institute through Maj. Leconte.

Very fine specimen of Cinnabar, from the new Almaden mines, California, (weight 16 lbs. 10 oz.) Presented by Capt. J. Henry Smith.

January 22d.

Two species of *Murex* ———. Presented by Mr. Hanson.
Ceratomyxina polyphemus, *C. aurata*, *C. frontalis* and *Chrysocroea aurata*. Presented by Rev. Samuel Hazlehurst through J. A. Clay, Esq.

February 5th.

Twelve specimens of iron ores, Berks Co., Pa. Presented by Mr. Giffhams.
 Ponnite from Lancaster Co., Pa. Presented by Robert H. Lamborn.
 Specimens of Bologna phosphorus, from Italy. Presented by Dr. J. R. Barton.
 Fossil jaw of a fish, *Edestus vorax*, from the carboniferous formation of Arkansas. Presented by Wm. S. Vaux, Esq.

February 19th.

Pisa bicorna, *Othonia quinqueidentata* ? *Chlorodius floridanus*, *Eriphia gonagra*, *Panopeus Herbatii*, *Lupa dicantha*, *Cardisoma Guanhumi*, *Ocypode arenaria*, *Grapsus cruentatus*, *Pagurus granulatus*, *Pagurus vittatus*, *Cenobita Diogenes*, *Porcellana sexspinosus*, *Squilla scabricauda*, *Squilla vittata*, (13 genera, 15 species, 26 specimens;) two specimens of an Annelide and its tube; four specimens *Asterias*; eight specimens *Ophiura*; ten species *Polyps*, numerous specimens; three specimens fishes, two species; two species *Anemone*, six specimens; five species *Mollusca*; five species sponges; two species corals; two species *Holothuria*, four specimens; six species marine Algae. All from the coast of Florida. Presented by Mr. S. Ashmead.

DONATIONS TO LIBRARY

IN JANUARY AND FEBRUARY, 1856.

January 1st.

U. S. Naval Astronomical Expedition to the Southern Hemisphere, Lieut. J. M. Gilliss, Superintendent, Vol. 2, 4to. From the Author.

Reports of the Superintendent of Education for Lower Canada, 1853 and 1855. From M. Huguet Latour.

The following were presented by Dr. Wilson on the usual condition :

Monographie des Guépes Sociales. Par H. de Saussure. No. 7.

Synopsis Plantarum Glumacearum. Autore E. G. Steudel. No. 10.

Xenia Orchidacea. Von H. Gastav. Reichenbach, Fil. No. 4.

Quadrupeds of North America. By J. J. Audubon and Rev. J. Bachman. Text vol. 3, royal 8vo.

Indicis generum Malacozoorum primordia conscripsit A. N. Hermannsen ; editio nova, 8vo.

Flora van Nederlandsch Indië. Door F. A. W. Miquel. Deel 1, af. 1, 2.

Herr Dr. Emil Wolff in Hohenheim und die Agricultur-Chemie. Nachtrag zu den "Grundsätzen der Agricultur-Chemie," von Justus von Liebig.

Zeitschrift für Wissenschaftliche Zoologie herausg. von C. T. von Siebold und A. Kölliker. Band 7, heft 3.

Mittheilungen aus Justus Perthes' Geographischer Anstalt über wichtige neue Erforschungen auf dem Gesamtgebiete der Geographie. Von Dr. A. Peterman, 1855, Nos. 1—8.

Recherches sur les Orinoides du Terrain Carbonifère de la Belgique. Par L. de Koninck et H. le Hon. 4to.

Beiträge zur Naeheren kenntniss der Urweltlichen Säugethiere. Von Dr. J. J. Kaup. Heft. 2, 4to.

Illustrations of the Birds of California, Texas, &c. By John Cassin. No. 10 ; completing Vol. 1.

London Athenæum for Nov., 1855.

Journal of the Franklin Institute for Dec., 1855.

The Mammals of Australia. By J. Gould. Part 7, folio.

The Birds of Asia. By John Gould. Part 7, folio.

The Birds of Australia. By John Gould. Supplement No. 2, folio.

Monograph of the Trochilidæ. By John Gould. Parts 9 and 10, folio.

The Ferns of Great Britain and Ireland. By Thos. Moore. Edited by John Lindley. Nature printed by Henry Bradbury. Folio, Nos. 1—9.

Conchologia iconica. By Lovell Reeve. Parts 148, 149, 150.

Schreber "die Säugethiere," fortgesetzt von Wagner. Supplement band, Hef. 14, 15, 16, 17, 4to.

Neues Jahrbuch für Mineralogie, Geognosie, Geologie, &c. Herausg. von Dr. Von Leonhard und Dr. H. G. Bronn, 1852, '53, '54, and Nos. 1—5, 1855.

De l'Homme et des Races Humaines. Par Henry Holland. 12mo.

Suites à Buffon. Histoire des Insectes. Genera des Coléoptères. Par M. Th. Lacordaire. Tome 3, 8vo.

Histoire naturelle des Mammifères. Par M. Paul Gervais. Royal 8vo.

Report of the British Association for 1854.

Orr's Circle of the Sciences ; a series of Treatises on the Principles of Science, Geology, Mineralogy, &c. By Profs. Ansted, Tennant and Rev. W. Mitchell. 8vo., 1855.

New Zealand and its inhabitants. By Rev. Richard Taylor. 8vo.

Annals and Magazine of Natural History, Dec., 1855.

London, Edinburgh and Dublin Philosoph. Magazine, December, 1855.

Annales des Sciences Naturelles. 4me serie, tome 3, No. 6.

Revue et Magasin de Zoologie, 1855, No. 10.

Comptes Rendus. Tome 41, Nos. 18—23.

iii.

February 5th.

- American Journal of Science and Arts, Jan., 1856. From the Editors.
 Proceedings of the Boston Society of Natural History, Vol. 5, pp. 257—272. From the Society.
 New York Medical Times, Jan., 1856. From the Editors.
 Journal of the Society of Arts, (London,) Nos. 137—148. From the Society.
 Transactions of the Linnean Society of London, Vol. 21, part 4. Proceedings of same, Vol. 2, pp. 333 to conclusion, with index and title page. List of the Society for 1855; and Anniversary Address of the President, Thomas Bell, Esq., May 24, 1855. From the Linnean Society.
 Transactions of the Zoological Society of London, Vol. 4, parts 2 and 3. Proceedings of the same, 1850, '51, '52, '53, '54 and part of '55. From the Zoological Society.
 A Synopsis of the Classification of the British Palaeozoic Rocks, by the Rev. Adam Sedgwick: and British Palaeozoic Fossils, by Frederick McCoy. 3d fasciculus, 4to. From Prof. Sedgwick.
 History, condition and prospects of the Indian Tribes of the United States. By Henry B. Schoolcraft. Part 5, 4to. From the U. S. Commissioner of Indian Affairs.
 Reports of the explorations and surveys for a Railroad from the Mississippi to the Pacific Ocean. Vol. 1. 4to. From the U. S. War Department through Col. Abert.
 Proceedings of the American Philosophical Society, May to December, 1855. From the Society.
 Charleston Medical Journal and Review for Jan., 1856. From the Editors.
 New York Medical Times for Feb., 1856. From the Editors.
 Description of the Fossils and Shells collected in California by Wm. P. Blake. From the Author.

February 12th.

- Dr. Wilson presented the following on the usual condition:
 Les Trois Règnes de la Nature. Introduction; Le Muséum d'histoire naturelle par P. A. Cuv., 1 vol.; Botanique par M. Le Maout, 1 vol.; Mammifères par M. Paul Gervais, parts 1 and 2. Royal 8vo.
 Abel's "Aus der Natur." No. 6.
 Systematische Beschreibung der bekannten Europäischen zweiflügeligen Insecten von J. W. Meigen. Nos. 1 and 2, 8vo.
 Zeitung zur Verbreitung naturwissen. Kenntnisse. Von Dr. Ule und Dr. Carl Müller. Nos. 44—51.
 Agrostographia Capensis; Scripsit C. G. Nees ab Esenbeck. 2d ed., 8vo.
 Handbuch der Zootomie von Siebold und Stannius. Part 2, 8vo.
 Naturwissenschaft und Bibel. Von Andreas Wagner.
 Systematische Uebersicht der Thiere Brasiliens. Von Dr. H. Burmeister. Part 2, 8vo.

February 19th.

- Journal of the Academy of Natural Sciences of Philadelphia, New Series, vol. 3, No. 2, 4to. From the Publication Committee.
 Proceedings of the Boston Society of Natural History, vol. 5, pp. 273—288. From the Society.
 Journal of the London Society of Arts, &c., Nos. 119—158. From the Society.

DONATIONS TO MUSEUM

IN MARCH AND APRIL, 1856.

March 4th.

Chlorastrolite. From Isle Royal, Lake Superior. Presented by B. A. Hoopes. Skull and skin of Tamaro, (a species of Antelope from Mindoro, one of the Philippine Isles); skull of Crocodile, from Manilla; skull of Dugong, from Philippines; and skull of Trionyx, from Manilla. Presented by W. W. Wood, Esq., of Manilla.

Collection of Lepidoptera from the vicinity of Philadelphia. Presented by Dr. Wm. Camac.

Specimen of Lava of Vesuvius, eruption of 1855. Presented by F. De B. Richards.

March 11th.

Eleven specimens of impressions of Algae in the Old Red Sandstone of Schuylkill Co. Pa. Presented by P. W. Shaeffer, of Pottsville.

Seven specimens Coal Plants, from Schuylkill Co., Pa. From the same.

Specimen of Malachite, from St. Paul di Loando, W. Africa. From Dr. J. L. Burt, U. S. N.

Emerald Nickel, from Lancaster Co., Pa.; Tremolite, from Chester Co., Pa. Presented by R. H. Lamborn.

Small collection in Natural History, consisting of shells, insects and fossils. Presented by T. A. Streng, of Saugatuck, Michigan.

Cardamom, from Princes Island. Presented by Dr. J. L. Burt, U. S. N.

Four specimens Ores of Manganese, Chester Co., Pa. Presented by J. G. Horner.

Four teeth and one vertebra of Charcarodon; three vertebrae of Crocodile; from the Marl of N. J. Presented by Dr. Hallowell.

Thirteen specimens Coal Plants. Deposited by W. F. Rogers.

Five specimens Silurian Fossils. From the same.

Specular Iron Ore from Marquette, Lake Superior. From the same.

March 18th.

One hundred and forty-six Bird Skins, comprising 129 Species of 105 Genera, viz:—Apteryx, Apternus, Alcyone, Abrornis, Arses, Anthus, Agrodromia, Arremon, Brachypternus, Brachynrus, Brachypus, Brachypteryx, Budytes, Crypturus, Chasmorhynchus, Corvus, Cornix, Campephilus, Cerchneipicus, Ceryx, Corythornis, Centropus, Criniger, Corydalla, Charadrius, Coturnix, Chlorophonia, Chiroxiphia, Culicipeta, Caprimulgus, Cypselus, Chettusia, Diplopterus, Drymoica, Dysithamnus, Dasycephala, Dicrurus, Erythropus, Erythacus, Euphonia, Erythrosterne, Formicivora, Gracula, Garrulax, Gallinago, Galbula, Harpactes, Holmesia, Hyloterpe, Kittia, Leucopternus, Lipangus, Lycos, Lamprotornis, Lobivaneilus, Lanius, Lalage, Loriculus, Locustella, Microglossus, Monasa, Malacocercus, Malacoptila, Megalaima, Meropixus, Megalophonus, Merula, Myrmeciza, Musicapa, Nyctastes, Napothera, Nyctibius, Ortygometra, Octocoris, Pionus, Pratincola, Picnonotus, Pipra, Platyrhynchus, Picumnus, Planesticus, Pycnosphrys, Phalaropus, Porzana, Phoenicotheropus, Pachyrampus, Pyrrota, Poecila, Pratincola, Pereirocotus, Rhinoplax, Rhipidura, Selenidera, Sporophila, Tijuca, Turdilostris, Trichostoma, Tanagrella, Thinornis, Turdus, Tyrannula, Thamnophilus, Tinamus, Totanus, Vanellus. Presented by Wm. S. Wilson, Esq.

Forty-one specimens of Crustacea from Mexico, comprising 16 Species of 13 Genera, viz:—Albunea, Calappa, Grapsus, Geocarcinus, Gelasinus, Guaiia, Hippa, Mithrax, Othonia, Ozius, Pagurus, Porcellana, Squilla. Presented by Wm. S. Wilson, Esq.

Two specimens *Helix Leidyi* Hall and Meek, from the Maurraises Terres of Nebraska. Presented by Dr. F. V. Hayden.

Jaws of Shark, from Coast of Florida. Presented by Dr. G. Watson.

April 1st.

Fourteen specimens, nine species Sponges; five specimens Echini; three specimens Ophiothrix; one specimen Sertularia; four specimens Spatangus; twenty-four specimens Corals; thirty specimens recent Shells; seven specimens Fossil Shells; ten fragments fossil Cetacean bones; two specimens eggs of Fulgur; two specimens two species Fungi; four specimens Rocks and one mass of Vermetus. From Key West and Manatee River, Florida. Presented by S. Ashmead, Esq.

A collection consisting of about 500 species of dried plants, from the Mountains of Pennsylvania. Presented by C. E. Smith, Esq.

Calcareous Tufa, enclosing *Lymnea umbrosa*, from near Mohawk, N. J., Presented by Mr. I. Lea.

Two specimens *Cyclas*, from Alabama. Presented by T. M. Peters.

Pisa n. s.; *Panopeus Herbstii*; *Lupa*, young?; *Gelasimus macrocheles*; *Sesarma cinerea*; *Alpheus heterochelae*; *Gonodactylus chiragra*. From Key West and Manatee. Presented by S. Ashmead, Esq.

Libinia dubia; *Platycarcinus Bayi*; *Platyonychus ocellatus*; *Grapsus pictus*; *Calappa marmorata*; *Calappa*, n. s.? seven species of six genera, from W. Indies. Presented by Mr. I. Lea.

Bigonia incarnata (fruit); *Scolopendra* ———? From Trinidad. Presented by Dr. Samuel Lewis.

April 8th.

Seven hundred specimens, eighty species, of Cuban Coleoptera. Presented by G. J. Baruet, Esq., of Cuba, through Mr. Guex.

Agelaius phoeniceus and *Fringilla canadensis*. Presented by Mr. John Krider.

Eighteen specimens plants; four minerals: (beryl, amethyst, quartz, and felspar.) Presented by Dr. C. F. Hart, of Pittsburg, Penn.

April 15th.

One half of lower jaw of *Casteroides Ohioensis*; first upper molar *Megalonyx Jeffersonii*; one canine and fragment of upper jaw with three molars of *Caster fiber* fossils; one milk molar of *Mastodon*; and two molars of *Casteroides Ohioensis*. From Prof. Stillman, in exchange.

Pinna, from Teresa Bay, Florida; three specimens Calcedony; a *Diodon*, from Key West; and three Calcedonized corals, from Tampa Bay, Florida. Presented by S. Ashmead.

Seventy specimens (65 species) of reptiles. In exchange from the Jardin des Plantes, Paris.

Angora Cat. Presented by Mrs. Wm. Wister, Germantown.

One *Pleuronectes*; one *Murina*; two *Ophisaurus*; and one *Coluber*. Presented by Mr. Wm. G. Burke, through Mr. Cassin.

Syngnathus fasciatus, from S. America. From Dr. Doek.

April 22d.

Sixty-six species Marine Alga, from the Coast of Florida. Presented by S. Ashmead.

Native Silver, from Lake Superior. Presented by Mr. Hoopes.

Fifteen specimens *Triton niger* and one of *Phrynosoma*. Presented by Dr. Uhler.

Marine Alga collected by Mr. S. Ashmead, at Key West, Florida, during the winter of 1855. '56. and presented by him:—*Padina pavonia*, Lam., Sand Key, Florida.

Dictyota fasciola, Lam., Key West, Florida; *Amansia multifida*, Lam., do.; *Alsidium triangulare*, J. Ag., do.; *A. Bloodgettii*, Har., do.; *Chondria littoralis*, Har., do.; *Digenia simplex*, Ag., do.; *Polysiphonia Olneyi*, Har., Manatee River, Florida; *P. secunda*, Mont., Key West, Florida; *P. Pecten veneris*, Har., do.; *Bostrychia Montagnei*, Har., do.; *B. calamistrata*, Mont., do.; *Dasya Gibbsii*, Har., do.; *D. elegans*, Ag., do.; *D. elegans*, Ag., var., do.; *D. Wurdemanni*, Bail., do.; *Champia parvula*, Har., Manatee River, Florida; *Delesseria involvens*, Har., Key West, Florida; *D. tenuifolia*, Har., do.; *Eucheuma isiforme*, J. Ag., do.; *Liagora valida*, Har., Sand Key, Florida; *Wrangelia penicillata*, Ag., Key West, Florida; *W. penicillata*, Ag., var., do.; *W. penicillata*, Ag., var., do.; *Spyridia aculeata*, Kutz., Sand Key, Florida; *S. aculeata*, Kutz., var., do.; *S. filamentosa*, var. *refracta*, Har., Key West, Florida; *Hypnea musciformis*, Lam., do.; *Codium tomentosum*, Manatee River, Florida; *Centrocercus clavulatum*, Ag., Key West, Florida; *C. clavulatum*, Ag., Sand Key, Florida; *Ectocarpus* — ? Manatee River, Florida; *Crouania attenuata*, J. Ag., Key West, Florida; *Champia salicornoides*, Har., do.; *Spyridia filamentosa* (turned green by decay) Sand Key, Florida; *Wurdemania setacea*, Har., Key West, Florida; *Phyllophora Broadiæi*, J. Ag., do.; *Halymenia ligulata*, Ag., Manatee River, Florida; *Scinata furcellata*, Hivona, Key West, Florida; *Phyllerpa prolifera*, Kg., do.; *Dasycladus claviformis*, do.; *Dictyosphaeria favulosa*, do.; *Bryopsis plumosa*, do.; *Anadyomene stellata*, Lam., do.; *Dasya Tumanowiezi*, Gatty, do.; *D. ramosissima*, Har., do.; *D. ramosissima*, Har., var. a, do.; *D. elegans*, Ag., Manatee River, Florida; *Ceramium rubrum*, Ag., Key West, Florida; *Corallocephalus Lamourouxii*, Kg., do.; *C. — ?* do.; *Cymnopolia barbata*, Lam., do.; *Udotea fiabellata*, Lam., do.; *U. conglutinata*, Lam., do.; *Acetabularia crenulata*, Lam., do.; *Laurencia* — ? do.; *L. — ?* do.; *Acanthophora Thierli*, Lam., do.; *Cladophora cespitosa*, do.; *Caulerpa (Chauvinia) Wurdemanii*, Har., do.; *C. — ?* do.; *C. — ?* do.; *C. — ?* do.; *C. — ?* do.; *Calenella pinnata*, Har., do.

DONATIONS TO LIBRARY

IN MARCH AND APRIL, 1856.

March 4th.

Report of the Commissioner of Patents for the year 1854. Agriculture. From the U. S. Patent Office.

Report of the Secretary of the Treasury on the State of the Finances for the year ending June 30, 1855. From the Hon. Wm. Bigler.

Report of the Secretary of the Treasury on the Commerce and Navigation of the United States for the year ending June 30, 1855. From the same.

Report of the Superintendent of the Coast Survey for the year 1854. 4to. From the same.

American Journal of Science and Arts for March, 1856. From the Editors.

New York Medical Times for March, 1856. From the Editors.

Japanese Botany: being a fac simile of a Japanese Book, with introductory notes and translations. From the Translator (Dr. Jos. Wilson, U. S. N.)

March 11th.

Dr. Wilson presented the following on the usual condition:

Ansichten der Natur von Alex. von Humboldt. 2 vols. 8vo.

Agassiz und seiner Freunde geologische Alpen in der Schweiz. Savoyen und Piemont. Herausg. von Dr. Carl Vogt. 8vo.

Histoire naturelle generale des Règnes Organiques. Par M. Isidore Geoff. St. Hilaire. Tome 2, 1me partie. 8vo.

- Histoire naturelle des Mollusques terrestres et fluviatiles de France.* Par A. Moquin Tandon. 5 liv. 8vo.
- Mineralienbuch oder Allgemeine und besondere Beschreibung der Mineralien.* Von Dr. F. A. Schmidt. 4to.
- The Micrographic Dictionary.* By J. W. Griffith, M. D., and A. Henfrey. 8vo.
- Orr's Circle of the Sciences. Organic Nature.* Vol. 3. 8vo.
- Neues Jahrbuch für Mineralogie, Geognosie, &c.; herausg. von Dr. von Leonhard und Dr. H. G. Bronn.* 1855. No. 6.
- Quarterly Journal of Microscopical Science* for Jan., 1856.
- Annals and Magazine of Natural History* for Jan. and Feb., 1856.
- London, Edinburgh, and Dublin *Philosophical Magazine* for Jan. and Feb., 1856.
- Report of the British Association for 1851.*
- London Athenæum* for January, 1856.
- Comptes Rendus.* Tome 42, Nos. 1, 2, 3.
- Revue et Magasin de Zoologie,* 1856. No. 1.
- Philosophical Transactions of the Royal Society of London,* 1851, part 2; 1852, parts 1 and 2; 1853, parts 1, 2, 3; 1854, parts 1 and 2; 1855, parts 1 and 2. 4to.
- Maps of the Society for the diffusion of Useful Knowledge.* (Bound in one vol. folio.)
- The last of the Arctic Voyages* in H. M. S. Assistance, Capt. Sir Edward Belcher, in search of Sir John Franklin. 2 vols. 8vo.
- Voyage autour du Monde sur la frigate La Venus, commandée par Abel du Petit-Thouars.* Text tome 5, 1me partie. Zoologie. 8vo.
- Museum Carolinianum, in quo novae et selectae Aves exhibit Andreas Sparrmann.* Folio.
- Scotia illustrata, sive prodromus Historiæ Naturalis.* Auctore Roberto Sibbaldo, M. D. Folio. 1684.
- L'Organisation du Règne Animal.* Par Emile Blanchard. Livs. 15, 16.
- Système des Oiseaux de l'Égypte et de la Syrie.* Par Jules-Cesar-Savigny. Folio.

April 1st.

- Second Supplement to Dana's Mineralogy.* By the Author. From Prof. Dana.
- On the Birds received in Collections from Santa Fé de Bogota.* By P. L. Selater. From the Author.
- Proceedings of the Boston Society of Natural History,* vol. 5, pp. 289—304. From the Society.
- Report on the Geological and Agricultural Survey of the State of Rhode Island in the year 1839.* By Charles T. Jackson, M. D. 8vo. In exchange.
- Genera des Coléoptères.* Par M. Th. Lacordaire. Tome 3. 8vo. From the Author.
- First and second Annual Reports of the Geological Survey of Missouri.* By G. C. Swallow. 8vo. From Mr. F. B. Meek.
- Revision of the Cicindels of the United States.* By John L. Le Conte, M. D. From the Author.
- Annals of the Lyceum of Natural History of New York,* vol. 6, No. 5. From the Lyceum.
- Charleston Medical Journal and Review,* March, 1856. From the Editors

April 8th.

- Dr. Wilson presented the following on the usual condition :—
- Annales des Sciences Naturelles.* 4me serie, tome 4, No. 2.
- Revue et Magasin de Zoologie.* 1855. No. 12.
- Comp'tes Rendus.* Tome 42, Nos. 4, 5, 6, 7, 8.

- Zeitschrift für Wissenschaftliche Zoologie von C. T. von Siebold und A. Köliker. Vol. 7, No. 4.
 Neues Jahrbuch für Mineralogie, Geognosie, &c., herausg. von Dr. K. C. v. Leonhard und Dr. H. G. Bronn. 1855. No. 7.
 Malakozoologische Blätter. Nov. and Dec., 1855.
 Zeitung zur Verbreitung naturwissen. Kenntniss, &c. Von Dr. Otto Ule und Dr. K. Müller. 1855, No 52; 1856, Nos. 1—4.
 London Athenæum for February, 1856.
 Conchologia iconica. By Lovell Reeve. No. 151.
 Journal of the Franklin Institute, March, 1856.
 Zoology of the Voyage of the Herald in 1845—'51, Capt. Henry Klett, Commander, part 1; Botany of the same, part 6. 4to.
 Ichthyology of South Carolina. By John E. Holbrook. Nos. 1—10. 4to.
 Les Trois Règnes de la Nature. Hist. nat. des Oiseaux. Par M. Em. le Maout. Royal 8vo.
 Die Alpen. Von Bernard Cotta.
 Essai sur l'histoire de l'Espèce Humaine. Par C. A. Walckenaer. 8vo.
 La Science Politique fondée sur la science de l'Homme, on étude des Races Humaines. Par V. Courtet de l'Isle. Royal 8vo.
 Ueber die Schädel der Avarer insbesondere über die seither in Österreich aufgefundenen. Von L. J. Fitzinger.
 De Salamandra terrestris vita, evolutione, formatione tractatus. Auctore A. F. Funk.

April 15th.

- Army Meteorological Register for twelve years, from 1843 to 1854, inclusive. Prepared under the direction of Gen. Thos. Lawson, Surgeon General, U. S. A. 4to. From A. H. Smith, Esq.
 Second copy of same. From General Lawson.
 Transactions and Collections of the American Antiquarian Society, vols. 1, 2, and part 1, vol. 3; Proceedings of same from Oct. 23, 1849, to Oct. 22, 1855; Catalogue of Library of same. 8vo. From the Society.
 Transactions of the Illinois State Agricultural Society. Vol. 1. 8vo. From Mr. Robert Kennicott.
 New Orleans Medical and Surgical Journal for March, 1856. From the Editors.
 New York Medical Times for April, 1856. From the Editors.
 General description of a remarkable fossil not known to be described, and by some supposed to be an Ichthyodondulite. By Prof. Wm. Hopkins, of Geneva College, N. Y. From the Author.
 Notes on the Anatomy of *Gymnopus spiniferus*, Dum. From the Author.

April 22d.

- The Mastodon giganteus of North America. By J. C. Warren, M. D. 2d edition. 4to. From the Author.
 Annual Report of the Trustees of the New York State Library. 1856. From the Trustees.
 Comptes Rendus. Tome 41, No. 27; Table des Matières du Tome 40. From Dr. Wilson.
 Annales des Sciences Naturelles. 4me serie. vol. 4, No. 1. From the same.
 Journal of the Franklin Institute for April, 1856. From the same.

ix.

DONATIONS TO MUSEUM

IN MAY AND JUNE, 1856.

May 6th.

Five Indian Crania, (Klikatak, Chinook, Sknoquammy, Nisqually,) from Washington Territory. From Dr. J. H. B. McClellan.

Living *Proteus anguinus*, from the Cave of Adelsberg, Styria. From Capt. McClellan.

A collection of Plants. From Mr. Tuckerman.

A collection of Arctic Plants. From Dr. Kane.

Myristica moschata, from China. From S. Drinker, Esq.

Eighty-seven specimens of *Plethodon niger*, and eight specimens of *Pseudotriton ruber*. From Drs. Hallowell and Leidy.

Twenty-seven specimens of larvae of *Pseudotriton ruber*, in various stages of development. From Dr. Hallowell.

Six *Plethodon erythronotus*; two *P. cinereus*; two male and two female *Cistuda Carolina*. From Mr. W. A. Hill.

Numerous specimens of *Staurotypus odoratus*, and one of *Cinosternon Pennsylvanicum*. From Dr. Hallowell.

Plethodon niger, *Spelerpes* (*Cylindrosoma*, Tsch.) *bilineata*. From Dr. Uhler.

One specimen of *Polychrus marmoratus*; three specimens of *Amphisbæna fuliginosa*; one specimen of *Hyla*; one of *Drynus*; and twelve other serpents, fishes and insects, from Surinam. From Dr. Wm. Keller.

Astacus astinis, from the neighborhood of Philadelphia; eight living specimens of *Plethodon niger*. From Dr. Hallowell.

May 13th.

Spermophilus Franklinii. From Mr. R. Kennicott.

Cuttle Fish, from the Atlantic Coast. From Mr. Ashmead.

Three specimens of lithoid Carbonate of Iron, from Maryland. From Mr. Chas. E. Smith.

May 20th.

Emys insculpta, from the neighborhood of Norristown. From A. C. Hill, Esq.
Brachyotris amarus, Hall., from the neighborhood of Philadelphia. From Dr. Hallowell.

Skeleton of an Albatross, (*Diomedea exulans*.) From Dr. Ruschenberger.

Twelve species of Shells, from Cuba. From F. A. Sauvalle, of Cuba.

June 3d.

Six specimens of Coal plants, from Tioga Co., Pa. From Mr. Jos. Jeanes.

Beans of *Gymnocarpus Canadensis*. From Dr. J. C. Fisher.

Specimens of four species of fishes, (*Leuciscus nigroneasutus*.) From Dr. Corse.

June 10th.

Chelonura serpentina. (A very large specimen.) From Mr. S. Tiffany, East Creek, N. J., through Mr. S. Ashmead.

The Herbarium of Jas. Read, Esq., consisting of plants of North and South America, West India, &c. From Mrs. Maria Eckert.

Skull of the Walrus, from the beach at Long Branch, N. J. From Prof. J. F. Frazer, with the provision that it may be loaned at any time, to a responsible Naturalist for comparison or description, with the consent of two Curators.

One specimen of *Astrucaria*, (the plant which yields the South American arrow root.) From Dr. Ruschenberger, through Dr. Carson.

Ambles eximius, *Emys geographicus*, *Tropidonotus niger*, *Rana pipiens*, (two specimens,) an *Elaphis*, (allied to *guttatus*.) 5 feet long, from Buffalo, New York and a large collection of fishes, from the same locality. From Dr. G. Watson.

Two Araucanian Skulls. From Dr. Ruschenberger.

X.

A small collection of Neuroptera, from Lake Superior; Phalangopsis, (two specimens;) Astacus, from Mammoth Cave. From Dr. Le Conte.

Emys insculpta, E. Muhlenbergii, E. picta, E. guttata, Staurotypus odoratus, from Norristown. From Mr. A. C. Hill.

Two Iguanians (Proctotretus;) two innocuous serpents, (Colubridæ,) from Chili. From Dr. Ruschenberger.

Proteus anguinus, from Adelsberg. From Dr. Foltz, U. S. N.

June 17th.

One adult specimen of the Musk Ox, (Ovibos moschatus,) in excellent condition. From Dr. E. K. Kane, U. S. N.

One hundred and fifty specimens of forty-three species of Marine Shells, from the coast of Peru. Embryo Whale; two specimens (one species) of Bird Skins; two specimens of Mammal Skins, from Behring's Straits; Octopus, from Conception Bay; Skull of an Otter, from Quiniquina Island. From Dr. T. J. Turner, U. S. N.

Indian Pot, from Washington Co., Alabama. From Wm. Coleman, through Dr. C. D. Meigs.

Alluvial Wood, found at Philadelphia, twenty-four feet below the surface. From Mr. J. S. Phillips.

Twenty-four hundred specimens of about nine hundred species of Coleoptera, from different parts of the globe. From Dr. T. B. Wilson.

DONATIONS TO LIBRARY

IN MAY AND JUNE, 1856.

May 6th.

The following were presented by Dr. Wilson, on the usual condition:—

Flora Boreali-Americana. By Sir Wm. J. Hooker. 2 vols. 4to. London, 1840.

The Ferns of Great Britain and Ireland. By Thos. Moore. Edited by J. Lindley. No. 12. Folio. London, 1856.

Conchologia Iconica. By Lovell Reeve. Part 152. 4to.

London Athenæum. March, 1856.

Quarterly Journal of Microscopical Science. No. 15. April, 1856.

Annals and Magazine of Natural History. March and April, 1856.

London, Edinburgh and Dublin Philosophical Magazine. March and April. 1856.

Narrative of the Voyage of H. M. S. Herald during the years 1845-'51. By B. Seemann. 2 vols. 8vo. London, 1853.

Novitatis Conchologicæ. Par Louis Pfeiffer Dr. Liv. 3, 4. 4to.

Revue et Magazin de Zoologie. 1856. Nos. 2 and 3.

Annales des Sciences Naturelles. 4me serie. Tome 4, No. 3.

Comptes Rendus. Tome 42, Nos. 9, 10, 11, 13.

Palæontographica. Beiträge zur Naturgeschichte der Vorwelt. Herausg. von W. Dunker und H. von Meyer. 4 band, 4 lief, 4to. Cassel, 1855.

Zeitung zur Verbreitung naturwissenschaftlichen kenntniss, &c. Herausg. von Dr. O. Ule und Dr. K. Müller. 1856. Nos. 5—12.

Mittheilungen aus J. Perthes' Geographischer Anstalt über Wichtige neue Erforschungen auf dem Gesamtgebiete der Geographie von Dr. A. Petermann. 1855. Nos. 5, 6, 9, 10, 11, 12.

Malakozoologische Blätter, Herausg. von Dr. K. T. Menke und S. Pfeiffer. Jan., 1856.

Bonplandia. Zeitschrift für die gesammte Botanik. 3 Jahrgang, Nos. 23, 24. 25; 4 Jahr. Nos. 3, 4.

Über das Gehörsorgan der Fischgattung Mormyrus. Von L. Fischer. 8vo. p. Freiburg, 1854.

Lehrbuch der Anatomie und Physiologie der Gewächse. Von H. Schacht. 1 Thiel, 8vo, Berlin.

Die Gesteinslehre. Von B. Cotta. 8vo. Freiburg, 1855.

Ueber organische Reste der Letzten Kohlengruppe Thüringens. Von J. G. Bornemann. 4to p. Leipzig, 1856.

Algarum Unicellularium genera nova et minus cognita. Auctore A. Braun. 4to p. Lipsiæ, 1855.

Der Geschlechtsapparat der Stylmatophoren in taxonomischer Hinsicht gewürdigt. Von A. Schmidt. 4to p. Berlin, 1855.

May 20th.

American Journal of Science and Arts, May, 1856. From the Editors.

Publications of the Historical Society of Pennsylvania; Chambersburg in the Colony and the Revolution; a sketch by Lewis H. Gannard. 8vo. Philadelphia, 1856. From the Society.

Charleston Medical Journal and Review, May, 1856. From the Editors.

The Canadian Naturalist and Geologist. By E. Billings. Vol. 1, Nos. 1 and 2. From the Editor.

Standard Alphabet for reducing unwritten languages and foreign graphic systems to a uniform Orthography in European letters. By Dr. R. Lepsius. 8vo p. London, 1855. From the Author.

Proceedings of the Boston Society of Natural History, Vol. 5, pp. 305—336. From the Society.

Catalogue of the books belonging to the Library Company of Philadelphia, vol. 3, 8vo. Philadelphia, 1856.

First and second Reports of the Geological Survey of Missouri. By G. C. Swallow. 8vo. 1855. From Dr. B. F. Shumard.

Synopsis of the classification of the Palæozoic rocks. By Rev. A. Sedgwick; with a systematic description of the British Palæozoic Fossils. By F. McCoy. 4to. London, 1855. From Prof. Sedgwick.

On the Sandstone Fossils of Connecticut River. By James Deane, M. D. 4to p. From the Author.

Untersuchungen über den inneren Bau einiger Rheinischen Brachiopoden. Von Dr. Fr. Sandberger. 8vo p. From the Author.

June 3d.

The following were presented by Dr. Wilson, on the usual condition:—

The Zoology of the voyage of the Herald. Reptiles and Fishes; by Sir J. Richardson. Botany; by B. Seemann, Ph. D. Parts 1—5, 4to.

Catalogue of Lepidopterous Insects in the collection of the British Museum. Part 1. Papilionidæ. 4to. London, 1852.

Catalogues of the British Museum in 8vo. viz.; Mammalia, part 2; Fish, marine Polyzoa, parts 1 and 2; Mollusca, part 4; Shells of South America collected by M. D'Orbigny; Shells of Cuba, collected by M. La Sagra; Shells of the Canaries, collected by MM. Webb and Bertholet; Bivalve Shells, part 1; Terrestrial operculated Mollusca; Entozoa; Nomenclature of Diptera, No. 1; Lepidoptera, parts 1, 2, 12 and 16; Neuroptera, parts 1, 2, 3, 4; Nomenclature of Neuroptera; Hymenoptera, parts 1 and 2; Nomenclature of Hymenoptera; Coleoptera, part 7; Parasitic insects, ———.

Crania Britannica, by J. B. Davis and J. Thurnam, M. D. Decade 1, 4to. London, 1856.

Geological map of Europe, by Sir R. Murchison, Prof. Nicol and A. Keith Johnston.

Tenby, a sea-side Holiday. By P. H. Gosse. 8vo. London, 1856.

Insecta Britannica, Diptera, Vol. 3. By F. Walker. 8vo. London, 1856.

Conchologia Iconica. By Lovel Reeve. Part 153. London, 1856.

Annales des Sciences Naturelles. 4me serie, Vol. 4, No. 4.

Comptes Rendus. T. 42, Nos. 14, 15.

London Athenæum. April, 1856.

- Xenia Orchidaceæ.* Von H. G. Reichenbach. Heft. 5, 6, 4to.
Bryologia Javanica. Auctoribus F. Dozy et J. H. Molkenboer. Fascic. 6, 7, 4to.
Journal of the Franklin Institute, May, 1856.
Geognostische Uebersichtskarte Deutschland, der Schweiz und der Angrenzenden Ländertheilen. Von H. Bach. Gotha, 1856.
Systematische Beschreibung der bekannten Europäischen zweiflügeligen Insekten. Von J. W. Meigen. Vols. 4—7, 8vo. Hamm.
Reiseskizzen aus Nord-ost-Afrika. Von Dr. Alfred Ed. Brehm. Nos. 1, 2, 3, 8vo. Jena, 1855.
Die Mikroskopische Fauna des Septarienthones von Hermsdorf bei Berlin. Von Dr. J. G. Bornemann. 8vo. Berlin, 1856.
Anatomisch physiologische Untersuchungen über die Retina bei Menschen und Wirbelthieren. Von Heinrich Müller. 8vo. Leipzig, 1856.
Flora von Nederlandsch Indië. Door F. A. W. Miguel. Erste deel. af 3, Derde deel, eerste Gedeelte, af. 1. Leipzig, 1855.
Zeitschrift für Wissenschaftliche Zoologie, herausg. Von C. T. Von Siebold und A. Kölliker. 8 band., Heft 1, 8vo. Leipzig, 1856.
Abels aus der Natur, No. 7.
Erdumseglung der k. Schwedischen fregatte Eugenie in den Jahren 1851 bis 1853. 8vo. Berlin, 1856.
Plagiochila Sandei D. Z. *Icone illustrata,* A. C. M. v. d. Sande La Coste, M. D., et F. Dozy. 4to p. Lug. Batav, 1856.
Die Befruchtung der Phanerogamen. Von L. Radlkofer. 4to p. Leipzig, 1856.
Zeitung zur Verbreitung Naturwissen. Kenntniss, &c., Herausg. Von Dr. Ule und Dr. Müller. 1856, Nos. 13—16, 4to.
Bonplandia, Zeitschrift für die gesammte Botanik. 4 Jahrgang, Nos. 1, 2, 5, 6.

June 10th.

- Proceedings of the Elliott Society of Natural History of Charleston, S. C.,* No. 1. From the Society.
Lichenes Americi Septentrionalis Exsiccati. Fascic. iii. et iv. Curante E. Tuckerman, A. M., &c. 4to. Bostonia, 1854. From the Author.
A Geological Reconnoissance of the State of Tennessee. By Jas. M. Safford, A. M., &c. Nashville, 1856. From the Author.
Report of the Secretary of the Navy for 1855. Washington, 1855. From the Navy Department.
New Orleans Medical and Surgical Journal, Vol. XII., No. 6. From the Editor.
New York Medical Times, Vol. V., No. 9; From the Editor.
Journal of the Society of Arts of London, Vol. IV., Nos. 163—175. From the Society.
Verhandlungen des Zoologisch-botanischen Verein in Wien, 1853, 1854, and Nos. 1, 2, 3 of 1856. 8vo. From the Association.
Württembergische naturwissenschaftliche Jahreshäfte. Herausg. von Drs. Mohl, Plieninger, Fehling, Menzel und Krauss. 1855, No. 3, and 1856, No. 1. From the Wurtemberg Society.
Denkschriften der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche classe. Band 9, 4to. From the Academy.
Jahrbücher der K. K. Central-anstalt für Meteorologie und Erdmagnetismus. Von K. Kreil. Herausg. durch die Kaiserliche Akademie der wissenschaften. III. Band, 4to. From the Academy.
Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Mathematische-Naturwissenschaftliche classe, XV. Band, No. 3, XVI. Band, Nos. 1, 2, XVII. Band, Nos. 1, 2, 3, 8vo. From the same.
Jahrbuch der Kaiserlich-Königlichen Geologischen Reichsanstalt, Nos. 1, 2. Wien, 1855. From the Institute.
Abhandlungen der Kaiserlich-Königlichen Geologischen-Reichsanstalt. II. Band. Wien, 1855. From the same.

Das Verfahren der natur bei Gestaltung des Thier-Reichs. Von H. Milne Edwards. Stuttgart, 1853. 8vo p. From the Author.

Bulletin de la Société Imperiale des Naturalistes de Moscow, 1854, Nos. 2, 3, 4, and 1855, No. 1. From the Society.

Questionum Ionicarum Liber. Auctor Dr. J. F. Lobeck, 8vo p. From the Author.

June 17th.

Fourth Annual Report of the Trustees of the Free Public Library of New Bedford. 8vo p. From the Trustees

Thirty-fifth Annual Report of the Mercantile Library Association of New York. 8vo p. From the Association.

Report on the Geology of Northern and Southern California. By Dr. John B. Trask. 8vo p. From the Author.

Mittheilungen der Naturforschenden Gesellschaft in Emden, für 1854. From the Society.

Die Temperatur von Emden, als Ergebniss der daselbst von 1844 bis 1853 auf den Stand des Thermometers gerichteten Beobachtungen. Von Dr. M. A. F. Prestel. 4to p. From the same.

Die Gallen. Versuch die durch Insecten an den Pflangen verursachten answüchse nach Ihren Haupttypen und Wachsthum's verhältnissen Naturgemäss zu Gruppiren. Von Georg. Frauenfeld. 8vo p. From the Author.

Ueber die Vertilger pflanzenschädlicher Insecten. Von G. Frauenfeld. 8vo p. From the Author.

Aufzählung der Algen der dalmaturischen Küste, &c. Von G. Frauenfeld. 8vo p. From the Author.

Beitrag zur Insectengeschichte. Von G. Frauenfeld. 8vo p. From the Author. Beobachtungen ueber Insectenmetamorphosen. Von G. Frauenfeld. 8vo p. From the Author.

Ueber die ersten Stände von Plinthus Megerlei Pz. Von G. Frauenfeld. 8vo p. From the Author.

Ergebnisse einer mit Unterstützung des hohen K. K. Oberst-Kämmererantes an die Küsten Dalmatiens, &c. Von G. Frauenfeld. 8vo p. From the Author.

Köhlerglande und Wissenschaft. Von Carl Voght. Giessen, 1855. 8vo p. From Dr. F. A. Genth.

On the new Red Sandstone Formation of Pennsylvania. Description of a new Sub-Genus of Naiades. Description of a new species of Triquetra. Description of new Fresh Water Shells from California. Description of twenty-five new species of Exotic Uniones. By Isaac Lea, LL.D., &c., &c. 8vo p. From the Author.

The following were presented to the Academy by Dr. Wilson, on the usual conditions:—

A Synopsis of the British Diatomaceæ. By Wm. Smith. Vol. II., 8vo, 1856. Sea Anemones, or Tanks and their inhabitants. Bath, 1856.

London, Edinburgh and Dublin Philosophical Magazine. Vol. II., No. 73.

Annals and Magazine of Natural History. Vol. 17, No. 101.

Journal of the Franklin Institute. Vol. 61, No. 366.

The Ferns of Great Britain and Ireland. By Thomas Moore, F. L. S., &c. Edited by John Lindley, Ph. D. &c. Parts XIII. and XIV.

Histoire Naturelle des Mollusques Terre-tres et Fluviales de France. Par A. Moquin Tandon. Ge Livraison, Paris, 1855.

Mittheilungen aus Justus Perthes Geographischer anstalt über Wichtige neue Erforschungen auf dem Gesamtgebiete der Geographie von Dr. A. Petermann. 1856, 1. 4to.

Die Natur. Zeitung zur Verbreitung naturwissenschaftlicher Kenntnik und Naturanschauung für Leser aller Stände. Herausg. von Dr. Otto Ue und Dr. Karl Müller. Fünfter Jahrgang, Nos. 17, 18, 19, 20.

Bonplandia, Zeitschrift für die gesammte Botanik. IV. Jahrgang, No. 7, 8.

Palaeontographica. Beiträge zur Naturgeschichte der Vorwelt. Herausg. von W. Dunker und H. von Meyer. IV. Band, Fünfte Lieferung. Cassel, 1855, 4to.

DONATIONS TO MUSEUM

IN JULY AND AUGUST, 1856.

July 1st.

The Herbarium of Dr. W. P. C. Barton. Presented by Dr. T. B. Wilson.
Deweyite, Bone Hills, Chester Co. From Dr. Wm. M. Uhler.
Fowl with four legs. From Dr. Martin, U. S. N.

July 8th.

Three specimens *Pugettia gracilis*; two *Epialtus productus*; *Cancer magister*; *Pseudo carcinus Oregonensis*; *Telmessus serratus*; three marine Annelida: one Actinia; five Echinodermata; 10 Mollusca. Collected by Geo. Davidson, Esq., U. S. Coast Survey, and presented by Dr. Le Conte.

Numerous specimens of Lavas and Sulphurs from the volcanoes of Sandwich Islands. Presented by Dr. Charles Guillon, through Constant Guillon, Esq.

Numerous specimens of fossil bones of the Peccary, *Dicotyles compressus*, Gallena, Ill. Presented by Dr. Edward D. Kittoe.

Gallinaula Ore, N. J. Presented by John Krider.

July 15th.

Asbestos; Cellular Quartz, Bone Hills, Chester Co., Pa. Presented by Mr Uhler.

One Centipede, Venezuela. Presented by Dr. A. Lacombe.

One Heterodon, Venezuela. From Capt. James Wilson, through Mr. Draper.

One *Pseudotriton flavissimus* and one *P. marginatus*, Georgia. Presented by Maj. Le Conte.

Thirty-three specimens *Plethodon niger*; 240 specimens *Astacus Bartonii*, from neighborhood of Philadelphia. Presented by Dr. Hallowell.

August 12th.

Two Eskimo Crania. From Drs. J. K. Kane and S. W. Mitchell.

One specimen *Hyla graciosa*, five *H. squirilla*, six *Cystignathus nigratus*, one *Bufo guericus*, two *Engystoma Carolinense*; from Georgia. Presented by Major Le Conte.

One *Emys Muhlenbergii*, from the neighborhood of Philadelphia. Presented by Major Le Conte.

Nine larvæ of *Spelerpes bilineata*, of different ages. From near the Falls of Schuylkill. Presented by Dr. Uhler.

Two living specimens of *Tropidonotus leberis*, from the same locality. Presented by Drs. Leidy and Uhler.

Various young and more matured specimens of *Astacus Bartonii*, found abundantly near the Falls of Schuylkill. Presented by Dr. Bridges.

A living specimen of *Diemyctylus miniatus* (Raf.) (*Salamandra symmetrica*, Harlan,) from Schuylkill Haven. Presented by Mr. C. M. Cruson.

Two specimens of *Menobranchus*, from Portage Lake, Lake Superior. Presented by Mr. Wm. E. Dickinson, of the Isle Royale Mine, L. S., through Mr. B. A. Hoopes.

Two species *Surnia hudsonia*, one species *Tetras canadensis*. From Lake Superior.

DONATIONS TO LIBRARY

IN JULY AND AUGUST.

July 1st.

American Journal of Science and Arts. July, 1856. From the Editors.

Aperçu Historique au Sujet de la Société pour Secourir les Noyés, instituée à Amsterdam par J. A. Kool. 8vo. Amsterdam, 1855. From the Society.

Jacobi Breynii gedanensis Exoticarum aliarumque minus cognitarum Plantarum centuria prima. Anno 1677. From A. J. Brazier.

Prodrome de Paléontologie Stratigraphique Universelle des animaux mollusques et Rayonnés, &c. Par M. A. D'Orbigny. Paris, 1850, 3 vols., 12mo. From Dr. Lewis H. Steiner.

Eulogy on the life and character of Theodorice Romeyn Beck, M. D., &c. By F. H. Hamilton, M. D. From the Author.

Second Annual Report of the Geological Survey of the State of New Jersey, for the year 1855. Trenton, 1856.

Reports of Explorations and Surveys for a Railroad route from the Mississippi River to the Pacific Ocean, made in 1853—4. Vol. 1. Washington, 1855. From the Secretary of War.

The following were presented by Dr. Wilson on the usual conditions:

The London Athenæum, May, 1856.

Comptes Rendus hebdom. des Séances de l'Acad. des Sciences. T. lxii., Nos. 16, 17, 18, 19.

Die Mysterien der europäischen Insectenwelt. Durch Prof. Dr. J. Gistel, Kempten, 1856.

July 8th.

Eighth Annual Report of the Board of Managers and Treasurer of the Maryland Institute. Baltimore, 1856, 8vo. From the Managers.

New York Medical Times, July, 1856. From the Editor.

Charleston Medical Journal and Review, June, 1856. From the Editor.

London Journal of the Society of Arts. Vol. IV., Nos. 176, 177, 178, 179. From the Society.

Entomologische Zeitung. Herausg. von dem Entomologischen vereine zu Stettin. 16 Jahrgang. Stettin, 1855. From the Union.

Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefakten-Kunde, Herausg. von K. O. von Leonhard und H. G. Bronn. Jahrgang, 1856. 1 Heft. Stuttgart, 1856. From Prof. Bronn.

Gelehrte Anzeigen. Herausg. von Mitgliefern der k. bayer Akademie der Wissenschaften. Band 40, 41. From the Royal Academy of Sciences of Munich. Ueber die Gliederung der Bevölkerung des Königreichs Bayern. 4to. München, 1855. From the same.

Rede in der öffentlichen Sitzung der Königl. Akad. der Wissenschaften, &c. 4to. München, 1855. From the same.

Verzeichniß der Verlagsschriften, Reden und Abhandlungen der k. akad. der Wissenschaften. München, 1855, 12mo. From the same.

Jahresbericht des physikalischen Vereins zu Frankfurt am Main. From 1847 to 1854, inclusive. From the Senckenberg Natural History Society.

Verzeichniß der in dem Museum der Senckenbergischen Naturforschenden Gesellschaft aufgestellten Sammlungen. Abtheilung 1, 4, und Ethnographische Gegenstände. Frankfurt am Main. 1842, 1852, 1853. From the same.

Jahresberichte über das Frankfurter Dr. Senckenbergische Bürgerhospital, &c. Von Dr. J. B. Lorey. 1, 1846 bis 1852. Göttingen, 1854. From the same.

Statuen des physikalischen Vereins. Frankfurt am Main, 1855. From the same.

Observationes anatomicæ de Parte Cephalica nervi Sympathici, &c. By J. G. Varrentrapp. Franc. ad Mænum, 1831. From the same.

xvi.

De Melanosi. Auctor E. Schilling. Franc. ad Mænum, 1831. From the same.

Abhandlungen, Herausg. von der Senckenbergischen Naturforschenden Gesellschaft. 1 Band, 1, 2 Lieferung. Frankfurt a. M., 1855. From the same.

Disquisitiones anatomico-comparativæ de membro Piscium Pectorali, &c. A. C. Mettenheimer, M. D. Berolini, 1847. From the Author.

Mémoires et Publications de la Société des Sciences, des Arts et des Lettres du Hainau. 2e serie, T. 3me, 1856. From the Society.

De Symmetria et Asymmetria organorum animalitatis, imprimis Cranii. Dr. J. C. G. Lucæ. Marburgi, 1839. 4to. From the Senckenberg Natural History Society.

Schädel abnormer Form. Von Dr. J. C. G. Lucæ. Frankfurt am Main, 1855. From the same.

July 15th.

History of the Ordinance of 1787. By Edward Coles. 8vo p., 1856. From the Author.

Journal für Ornithologie. Herausg. von Dr. Jean Cabanis. I. Jahrgang, 1853, extra heft for 1853, II. Jahr., 1854, III. Jahr, 1855, and IV. Jahr. No. 19. 8vo. Cassel, 1854. From Dr. Cabanis.

Verzeichniss von ansegestopften Säugethieren und Vögeln, welche am 12ten Oct., 1818, u. folg. Tage in zoologischen Museum der Königl. Universität zu Berlin, &c. Berlin, 1818. From the same.

Preis-Verzeichnisse der Säugethier- und Vogel-Doublotten des Zoologischen Museums der Universität zu Berlin. Berlin, 1819. From the same.

Verzeichniss von Vögeln, Conchylien und Insecten, Doublotten des Zoologischen Museums hiesiger Königl. Universität, &c. Berlin, 1822. From the same.

Verzeichniss einer Sammlung Südafrikanischer Naturalien welche am 18ten Aug., 1834, &c. Berlin, 1834. From the same.

Verzeichniss einer Sammlung von Säugethieren und Vögeln aus dem Keffernlande, nebst einer Käfer-Sammlung, welche am 14ten März, 1852, &c. Berlin, 1842. From the same.

Verzeichniss verkäuflicher Doublotten der entomologischen Sammlung der Königlichen Universität zu Berlin.

Zweites Preisverzeichniss der Doublotten des Zoologischen Museums der Königl. Universität zu Berlin, Vogel und Insecten, Berlin, 1820. From the same.

Verzeichniss der Doublotten des Zoologischen Museums der Königl. Universität zu Berlin, &c. Herausg. von Dr. H. Lichtenstein. Berlin, 1823. From the same.

The Louisville Review, Vol. I., No. 2. From the Editors.

The Canadian Naturalist and Geologist, Vol. 1, No. 3. From the Editor.

Science and the Bible, No. 3. By J. D. Dana, LL. D., &c. 8vo. p, From the Author.

The following were presented by Dr. Wilson, on the usual conditions :

Journal of the Franklin Institute, Vol. 62. No. 367.

Annales des Sciences Naturelles, T. iv., No. 5.

Comptes Rendus, T. xlii., No. 20, 21.

Bonplandia, Zeitschrift für die gesammte Botanik. iv. Jahrgang, No. 9, 10.

Die Natur. Zeitung zur verbreitung naturwissenschaftlicher Kenntniss, &c. 5 Jahrgang, No. 21, 22, 23.

July 22d.

The Mutual Responsibilities of Physicians and the Community. By H. P. Tappan, D. D., &c. Detroit, 1856, 8vo p. From the Author.

Annual Report of the Trustees of the New York State Library, 1856. From the Trustees.

Recensio Avium in Academici Liberi Baronis de Mueller Ornithologico Museo

xvii.

Stuttgardiano collectarum. Colligit Dr. O. G. Calwer. Stuttgart, 1854.

Dr. Wilson presented the following, on the usual conditions:

Revue et Magasin de Zoologie Pure et Appliquée, 1856. No. 5.

Bonplandia. IV. Jahr., No. 11.

Zeitschrift für Malakozoologie. Pages 17 to 48, inclusive.

August 5th.

The following were presented by Dr. Wilson, on the usual conditions:

Flora van Nederlandsch Indië. Door F. A. W. Miquel, 1ste Deel Aft. 4. Leipzig, 1855. 8vo.

Lehrbuch der Anatomie und Physiologie der Gewächse. Von Dr. H. Schacht, 1er Theil. Berlin, 1855. 8vo.

Zeitschrift für Wissenschaftliche Zoologie. Herausg. von O. T. Siebold und A. Kolliker, 7er Band, Supplement heft. Leipzig, 1856.

Die Conchylien des norddeutschen Tertiärgebirges von Dr. E. Beyrich, 4te und 5te Lieferung. Berlin, 1856.

Mittheilungen aus Justus Perthes Geographischer Anstalt über Wichtige neue Erforschungen auf dem Gesamtgebiete der Geographie von Dr. A. Petermann. 1856, ii., iii., iv.

Novitates Conchologicæ. Von Dr. L. Pfeifer. 5 lief. Cassel, 1855.

Xenia Orchidaceæ. Von H. G. Reichenbach. 7 heft. Leipzig, 1856.

Flora Tertiaria Helvetiæ. Von Dr. O. Heer. Lief 2, 3.

Georg Forster der Naturforscher des Volks, von J. Moleschott. Frankfurt, 1855.

Systema Lichenum Germaniæ, von Dr. G. W. Koerber. Breslau, 1856. 8vo.

Sylloge Floræ Europææ seu Plantarum vascularium Europæ Indigenarum, &c. Auct. C. F. Nyman, Oerebrow, 1854—1855.

Classification der Brachiopoden von Thos. Davidson, Esq., &c., mit einigen neuen Zusätzen versehen von E. Suess. Vienna, 1856. 4to.

Zoonomische Briefe, Allgemeine Darstellung der thierischen organization. Von Dr. H. Burmeister, 1er Theil. Leipzig, 1856. 8vo.

Atlas zur Physik der Welt. Herausg. von T. Bromme, Stuttgart.

Untersuchungen über die Entwicklung der Blutgefäße, &c. Von Dr. T. Billroth. Berlin, 1856. 4to.

Geognostische Darstellung der Steinkohlenformation in Sachsen von H. B. Geinitz, 1te Abtheilung. Leipzig, 1856. 4to.

August 12th.

Ethnographic view of Western Africa. From Dr. S. Weir Mitchell.

The Canadian Journal of Industry, Science and Art, Nos. 1, 2, 3 and 4, 1856. From the Canadian Institute.

The Peninsular Journal of Medicine, July, 1856. From the Editors.

Speech of Hon. J. R. Tyson, delivered in the House of Representatives, July 12th, 1856. From the Author.

Proceedings of the Boston Society of Natural History, Vol. v. pp. 337—352. From the Society.

Proceedings of the American Philosophical Society, Vol. vi. No. 55. From the Society.

New York Medical Times, July, 1856. From the Editor.

Memoirs of the American Academy of Arts and Sciences, new series, Vol. v. From the Academy.

August 19th.

The following were presented by Dr. Wilson on the usual conditions:

Journal of the Franklin Institute, Vol. 62, No. 368.

Annales des Sciences Naturelles. Tome iv., No. 6.

The London Athenæum, June, 1856.

Comptes Rendus. T. xlii., Nos. 22—26, inclusive.

- A popular History of British Lichens. By W. Lindsay, M. D. London, 1856.
 Quarterly Journal of Microscopical Science, July, 1856.
 Annals and Magazine of Natural History, June and July, 1856.
 London, Edinburg and Dublin Philosophical Magazine, June and July, 1856,
 and Supplement.
 Conchologia Iconica. By Lovell Reeve. Parts 154, 155, 156.
 The Ferns of Great Britain and Ireland. By Thos. Moore, F. L. S. Edited
 by John Lindley, Ph. D. &c. Part xvi.
 The Birds of Asia. By J. Gould, F. R. S., &c. Part viii.
 L'Organisation du Règne Animal. Par Émile Blanchard. 17e Livraison.
 Reptiles.
 Mémoires de la Société Géologique de France. 2e Série, T. v. 2e partie.
 Mikrogeologie. Von C. G. Ehrenberg. Fortsetzung, Bogen 1—22. Leipsig,
 1856.
 Bonplandia, iv. Jahrgang, No. 12.
 Die Natur, No. 25—28, inclusive.
 Handbuch der Zoologie, von Siebold und Stannius. 2er Thiel. Berlin, 1856.
 Die in und an dem Körper des Lebenden Menschen Vorkommenden Parasiten,
 &c. Von Dr. F. Küchenmeister. 1te, Abtheilung, 1 and 2 Lief und 2e Abthei-
 lung.
 Conspectus Generum Avium. Auc. C. L. Bonaparte. Sectio secunda et tertia.
 List of the specimens of British Animals in the collection of the British Mu-
 seum. Part xi. Anoplura. London, 1852.
 List of Mollusca and Shells in the collection of the British Museum. London,
 1855.

DONATIONS TO MUSEUM

IN SEPTEMBER AND OCTOBER, 1856.

September 2d.

A collection of Fossil bones consisting of the humerus of a species of *Cervus*, the humerus of *Canis primævus*, and 5 cervical and 6 caudal vertebræ, fragments of 18 dorsal and lumbar vertebræ, fragments of 7 ribs, portions of 2 tibiae, small fragments of 1 scapula, 3 fragments of an ulna and a radius, 2 condyles of a femur, 3 fragments of an innominatum, 1 calcaneum, 1 astragalus, 2 cuboids, 1 cuneiforme, 5 metatarsals, 2 metacarpals and 5 phalanges of *Megalonyx Jeffersoni*. From a cave in the north of Alabama.

Fragment of a femur and of the antler of two species of *Cervus*, from the Pliocene deposits of Darlington, S. C., and the tooth of a *Phoca* ? from the Miocene of Virginia. Presented by Prof. Tuomey, of Tuscaloosa, Alabama.

Two fruits from Rio Grande. Presented by Dr. F. A. Genth.

Two species *Prionotus* and 2 do. *Platessa*, Absecon. Presented by Dr. Boker.

Astacus, n. s., Dayton, Ohio. Presented by Dr. J. O. Fisher.

Fossil coral, Ireland. Presented by John Vaughan.

Two Shark teeth, New Jersey. Presented by Dr. Coates.

Two *Salamandra rubra*. Presented by Dr. Uhler.

Twelve young of the Rattlesnake. Presented by Dr. Rand.

One *Coryphodon constrictor*, N. Jersey. Presented by Mr. Ashmead.

Five *Ambystoma punctatum*, N. Hampshire. Presented by Dr. LeConte.

Four large species *Menopoma alleghaniensis*, Ohio River near Pittsburg. Presented by Dr. Alfred King.

One *Heterodon platyrhynchos*, Penna. Presented by Dr. Wilson, U. S. N.

Serpentine precious, Newburyport, Mass. Presented by Dr. Uhler.

Allanite, Chester Co. Presented by Dr. W. D. Hartman.

Skeleton of *Tropidonotus sipedon*. Presented by Mr. F. Schaffhirt.

A collection of Shells. Presented by F. A. Sauvalle, of Havana.

xix.

September 9th.

Fifty specimens—25 species—Fishes from Beasley's Point, N. J. Presented by Mr. Ashmead and Dr. Leidy.

Specimens Stelactites from crevices of the cliff limestone, Galena, Ill. Presented by Hon. John G. Potts.

Agate, Calcedony, Montevideo. Presented by F. Bond, Esq.

Sulphate Magnesia, Phila. Co., Pa.; Cacozone, Montgomery Co., Pa.; Staurotide, Phila. Co., Pa. Presented by T. D. H. Rand.

Two fossil Shark teeth, Simoda; two fossil shells, Porto Praya; Crystals sulphate of lime, Cape de Verde; one specimen clay, Napa, Loo Choo; one Helix. Presented by Dr. Joseph Wilson, Jr., U. S. N.

One Gorgonia, coast of Delaware. Presented by Chas. Gilpin, Esq., through Dr. Elwyn.

September 16th.

A collection of reptiles as follows: Five *Emys pseudo-geographica*, three *Crotaphytus collaris*, five *Plestiodon obsoletus*, two *Holbrookia maculata*, five *Phrynosoma cornutum*, seven *Cnemidophorus gularis*, two *Ophisaurus striatulus*, two *Elaphis alleghaniensis*, one *Coryphodon flaviventris*, one *Coronella gentilis*, one *Tantilla gracilis*, three *Ablabes calligaster*, two species *Tropidonotus nudet*, one *T. ordinatus*, three *Heterodon nasicus*, four *Trigonocephalus contortrix*, one *Orotalus confluentus*, two *Herpetodryas vernalis*, one *Rana halecina*, one *R. pipiens*, one *Engystoma*, 22 specimens *Bufo americanus*? one *B. punctatus*, four *Rana conspersa*, one *Ambystoma*—79 specimens, 24 species, of 21 genera. Also *Helix monodon*, *H. fraterna*, *H. alternata*, *H. albolabrus*, *H. arborea*, and *Pupa armigera*. From Kansas. Presented by Dr. Hammond, U. S. A.

Two specimens mountain and arenaceous Guano, from Monk's Island and Mamarelda. Presented by Robert B. Baker.

Dactylopheros, Trinidad, W. I. Presented by Dr. S. Lewis.

September 23d.

Mergulus albus. Presented by Dr. S. Lewis.

A collection of shells. Presented by Townsend Ward, Esq.

Selenite. Presented by Dr. LeConte.

Native alum, California. Presented by A. H. Smith.

October 7th.

Several fragments of bones of *Megatherium*, and a molar tooth and several fragments of bones of the Mammoth, (*Elephas*.) From the excavation of the Brunswick Canal, Georgia. Presented by J. S. Phillips.

Two *Anas boschas*; one *Oidemia perspicillata*. Coast of Oregon. Presented by G. B. Davidson, Esq.

Original of *Coluber caligaster*, Say. Presented by Prof. J. Holbrook.

Fox squirrel. Presented by Thos. Kite.

Skin of *Cervus macrotus*. Presented by G. B. Davidson.

Ptilonopes Penonsii, Peale; Samoan Islands. Presented by Dr. Ruschenberger.

Eleven species, nine genera, Fishes from Lake George. Presented by W. S. Vaux, Esq.

Three species, two genera, Fishes from Schuylkill River. Presented by Dr. Uhler.

One species Fish. Presented by Mr. Guillon.

October 14th.

A collection of Fossils: Two vertebrae of *Basilosaurus*, four other vertebrae, twelve fishes vertebrae, sixteen shark teeth, two corals, and four casts of two species *Nautilus*; from the Eocene of Alabama. Presented by Dr. S. W. Clanton.

XX.

One hundred species of U. S. coast shells, including some recently discovered. Presented by Wm. Stimpson, Esq.

Four species of Fishes; 17 specimens, 10 species, Crustacea, California. Presented by G. B. Davidson, Esq., U. S. Coast Survey, through Dr. LeConte.

Fossil Echinus, cretaceous; Alabama. Presented by Dr. J. Nott, of Mobile.

Sixteen specimens, three species reptiles, New Jersey. Presented by Mr. C. Fisher.

Three *Pseudotriton niger*, Schuylkill River. Presented by Dr. Uhler.

One *Heredia oregonensis*, Gir.; California. Presented by Mr. Geo. B. Davidson, of the U. S. Coast Survey.

Two coal plants, and a nodule sulphuret iron. Presented by Dr. J. J. Hayes.

One Coral, Simoda Bay. Presented by W. Stimpson, Esq.

October 21st.

Twenty-nine specimens, 11 species of reptiles of the genera *Rana*, *Bufo*, *Plestiodon*, *Tropidonotus* and *Herpetodryas*. From Dr. Miles of Flint, Genessee Co., Mich., through Mr. Bowers.

Two specimens *Wavellite*, Chester Co., Pa. From R. H. Lambert, through Jacob Pierce.

Albino sylvia marilandica. From C. Kuhn.

DONATIONS TO LIBRARY

IN SEPTEMBER AND OCTOBER, 1856.

September 2d.

The American Journal of Science and Arts, September, 1856. From the Editors.

Proceedings of the Boston Society of Natural History, pp. 353—368. From the Society.

The New Orleans Medical and Surgical Journal, July, 1856. From the Editor.

Mémoires de la Société Royale des Sciences de Liège, T. 10me. From the Society.

Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefakten-Kunde. Herausg. von K. C. Leonhard und H. G. Bronn, Jahrgang, 1856, 2tes Heft. From Dr. Bronn.

Württembergische naturwissenschaftliche Jahreshefte. 12ter Jahrgang 2tes Heft. From Verein für Vaterländische Naturkunde.

Abhandlungen der Mathemat-Physikalischen classe der Königlich Bayerischen Akademie der Wissenschaften 7ten Bs. 3te Ab'g. München, 1855. From the Royal Academy of Sciences of Munich.

Rede über die Grenzscheide der Wissenschaften. Gehalten von F. von Thiersch. From the same.

Rede ueber den Begriff und die Stellung des Gelehrten. Gehalt. von F. von Thiersch. From the same.

Denkrede auf Johann Repomuk von Fuchs. Von F. von Kobell. From the same.

Verhandlungen des natur historischen Vereines der Preussischen Rheinlande und Westphalens. Herausg. von Prof. Dr. Budge, 12ter Jahrgang. 3tes und 4tes Heft, und 13ter Jahrgang, 1es Heft. From the Union.

September 9th.

Charleston Medical Journal, September, 1856. From the Editor.

New York Medical Times, September, 1856. From the Editor.

The following were presented by Dr. Wilson on the usual conditions:

Bulletin de la Société Impériale Zoologique d'Acclimatation. T. iii., Nos. 1—6 inclusive.

The Athenaeum, July, 1856.

Comptes Rendus, T. xliii., Nos. 1 and 2.

September 16th.

Annales des Mines, 5me série, T. vi., 6e livraison de 1854, T. vii., 1—6 liv. 1855.

Mémoires de la Société Impériale des Sciences, de l'Agriculture et des Arts, de Lille, Supplément à l'année, 1853. From the Society.

Mémoires de la Société Impériale des Sciences Naturelles de Cherbourg. 3e vol. Paris, 1855. From the Society.

Memorias de la Real Academia de Ciencias de Madrid. T. ii. 1 ser. ciencias exactas, t. 1, pte 1a. 1853. T. i. ciencias naturales, t. 1, pte 3a. 1854. From the Academy.

Resumen de las actas de la Academia Real de Ciencias de Madrid, 1851 to 1853. From the Academy.

Memoire della Reale Accademia delle Scienze di Torino. Ser 2da, T. xv. From the Academy.

Third Supplement to Dana's Mineralogy. From the Author.

Proceedings of the Boston Society of Natural History, pp. 369—384. From the Society.

The following were presented by Dr. Wilson on the usual conditions :

Physiotypia Plantarum Austriacarum. Von Constantin von Ettingshausen und Alois Pokorney. Wien, 1856, 1 vol. text, 5 vols. plates.

Bonplandia, ii. Jahrgang, Hanover, 1854, iv. Jahr., 13, 14.

Die Natur, 5ter Jahr., 28—32.

Revue et Magazin de Zoologie, 1856 No. 7.

Versuche und Resultate über die Nahrung der Pflanzen. Von Fürsten zu Salen-Herstmar Braunschweig, 1856.

Zeitschrift für Wissenschaftliche Zoologie, 8ter band. 2tes Heft, 1856.

Die Tineen und Pterophoren der Schweiz. Von Prof. Heinrich Frey, Zurich, 1856.

Essai Monographique sur les Clérites Insectes Coléoptères. Par Maximilian Spinola. Gènes, 1844, 2 vols.

Mittheilungen aus Justus Perthes' Geographischer Anstalt, &c. Von Dr. A. Petermann, 1856, v. vi.

Xenia Orchidacea. 8tes heft, 1856.

Über die durch Molekularbewegungen in starren leblosen Körpern bewirkten Formveränderungen. Von J. F. L. Hausmann. Göttingen, 1856.

Pflanzenphysiologische Untersuchungen. Von Carl Nägeli und Carl Cramer. Heft 1 and 3. Zurich, 1855.

Über den Bau der Nerven-Primitivfaser und der Nervenzelle. Von Dr. B. Stilling. Frankfurt a. m., 1856.

Beiträge zur Nacherkenntnis der Urveltlichen Säugethiere, von Dr. J. J. Kaup, 1tes heft. Darmstadt, 1854.

Flora Tertiaria Helvetiae. Von Dr. O. Heer, iv. v. Lieferung.

Comptes Rendus, T. xliii., Nos. 3, 4, 5, et Table des Matières du Tome xli.

Naturgeschichte der Insecten Deutschlands. Begonnen von Dr. W. F. Erichson Fortgesetzt von Dr. H. Schaum, G. Kraatz und H. V. Kiesenwelter, 1ste Abth. 1ste Band, 1ste Lief.—2ter Bd. 1ste, 2te Lief. Berlin, 1856.

September 23d

The following were presented by Mr. Edward Wilson on the usual conditions :
De Goniatitis in Montibus Rhenanis occurrentibus. Auc. H. E. Beyrich. Bero-
lini, 1837. 4to. p.

Monographia Cavium Porcelli Zoologica. Ed J. J. Freuler. Göttingen, 1820.

Charakteristik der Thierpflanzen. Von J. S. Schröter. Nürnberg, 1798.

Curtii Sprengel, Commentarius de Partibus quibus insecta spiritus ducunt. Lipsiae, 1815.

- De Ornithorhyncho Paradoxo. Auc. L. M. Jaffé. Berolini, 1823.
 Piscium querelæ at Vindiciæ. Expositæ à J. J. Scheuchzero. Tiguri, 1708.
 Beschreibung einiger minderbekannten Seethiere, und ihren Eigenschaften.
 Von J. B. Bohadsch, Dresden. 1776.
 Epistola de Balanopteris quibusdam ventre sulcato distinctis. Quam viro
 summe venerando J. F. Blumenbachio, Grat. Scrip. D. F. Rosenthal et D. F.
 Hornschuch. Gryphis, 1825.
 Die Fährten-Abdrücke im bunten Sandsteine bei Jena. Von Dr. K. Koch
 und Dr. E. Schmid. Jena, 1841.
 Bericht über die Naturhistorischen Reisen der Herren Ehrenberg und Hemp-
 rich, Gelesen von Alex. von Humboldt. Berlin, 1826.
 Illustrazioni al Genere Cipridina e descrizione di una novella specie Di Orom-
 zio Gabriele Costa.
 Ein Nachtrag über den Didus Ineptus von Lehmann, 1848.
 Etwas über die Natur Wunder in Nord America zusammengetragen. Von
 Chas. Cramer. St. Petersburg, 1837.
 Facts concerning the natural history of the Gigantic Irish Deer. By H. H.
 Richardson. Dublin, 1846.
 Über den Bau des Pentacrinus caput Medusæ. Von Hrn. Müller.
 Über den glatten Hai des Aristoteles, und über die Verschiedenheiten unter
 den Haifischen und Rochen in der Entwicklung des Eies. Von Hrn. Müller.
 Dissertatio de Fabrica et usu antennarum in Insectis. Grat. G. F. Erichson.
 Beroline, 1847.
 Commentatio Pharmacologico-Medica de Spongia Marina. Auc. A. F. Uhle.
 Lipsiæ, 1820.
 Bemerkungen über den Bau des Amphioxus lanceolatus. Von H. Rathke.
 Die Insekten im Bernstein. Von Dr. G. C. Berendt, 1tes heft. Danzig, 1830.
 Observationes de Prima Insectorum Genesi, Scrip. A. Kölliker. Turici, 1842.
 Observationes in Porcelli sine Oviæ Cobayæ Historiam Naturalem. A. G. F.
 Schultz. Berolini, 1829.
 Disquisitiones Anatomico-Comparativæ de Membro Piscium Pectorali. Auc.
 C. Mettenheimer. Berolini, 1847.
 Systema Amphibiorum Lymphaticum disquisitionibus novis examinatum.
 Auc. J. Meyer. Berolini, 1845.
 Dissertatio inauguralis de Oculo Reptilium. Auc. A. Fricker. Tubingæ, 1837.
 De Spatularium Anatome. Auc. A. Wagner. Berolini, 1848.
 Commentatio de Pectinis in Oculo Avium. Auc. A. Huschke. Jenæ, 1827.
 De Phenomeno Generali et Fundementali motus Vibratorii Continui, etc.
 Scrip. Prof. J. E. Purkinje et Dr. G. Valentin. Wratislaviæ, 1835.
 De Acaro Scabiei Humano. Auc. E. M. Heyland. Berolini, 1836.
 Observationes de Sagitta mare Germanicum circa Insulam Helgoland inco-
 lente. Auc. R. Wilms. Berolini, 1846.
 De Trunco Palmarum Fossilium. Auc. C. G. Stenzel. Vratislaviæ, 1850.
 Afferunter Nonnulla ad Amiam Calvam Accuratius Cognoscendam. Auc. H.
 Franque. Berolini, 1847.
 De Corporum Heterogeneorum in Plantis Animalibusque Genesi. Auc. J. H.
 Schmidt. Berolini, 1825.
 Ueber Thierfährten im Bunten Sandstein. Von B. Cotta. Dresden und Leip-
 zig, 1839.
 Dissertatio Anatomica de Rana Cornuta. Submit. C. G. Klotzke. Berolini,
 1816.
 De Hepatis Ranarum Extirpatione. Auc. F. T. Kunde. Berolini, 1850.
 Ueber verschiedene neue oder seltene Reptilien aus Neu Granada und Orus-
 tacen aus China. Von A. A. Berthold. Göttingen, 1846.
 Beiträge zur Naturgeschichte der Urwelt. Von J. C. Zenker. Jena, 1833.
 Strata identified by Organized Fossils. By Wm. Smith. London, June 1, Oct.
 1, 1816, Sept. 1, 1817.
 Prodromus descriptionis formarum partium Elementariarum in animalibus.
 Dr. C. A. S. Schultz. Berolini, 1828.

- Ueber Calamiten und Steinkohlenbildung. Von Dr. A. Petzholdt. Dresden und Leipzig, 1841.
- Bouwstoffen voor Eene Fauna van Nederland. J. A. Herklots. Leiden, 1851.
- Catalogo delle Conchiglie osservate dall' abate L. Brumat.
- Physiologiam animalium commendat et ad audiendam, &c. N. G. Leake. Lipsia, 1775.
- Conspectus animalium quorundam maritimorum nondum editorum, &c. A. G. Otto. Vratislavia, 1821.
- De Vegetativis et animatis corporibus, &c. Auc. J. F. M. de Olfers. Pars. i. Berolini, 1816.
- Analecta ad tuberculum et entozoorum cognitionem. Auc. G. Kauffmann. Berolini, 1847.
- Einsleitung in die Geschichte der Naturwissenschaft. Von J. Brots. Heidelberg, 1842.
- Allocuzione due del Prof. Gurgio Jan. Milano, 1842.
- Essai Statistique sur les Bibliothèques de Vienna. Par Adrien Balbi. Paris, 1835.
- Die Fische des Bodensees. Herausg. von Dr. St. Nanning, 1834.
- Synopsis Reptilium. F. A. A. Meyer. Göttingen, 1795.
- On the heat of Vapors. By J. W. Lubbock.
- On the Theory of the Moon, and on the Perturbations of the Planets. By J. W. Lubbock, Parts i. to ix.
- On the Heat of Vapors and on Astronomical Refractions. By J. W. Lubbock. London, 1840.
- Note on the calculation of the distance of a Comet from the Earth. By J. W. Lubbock.
- On the determination of the distance of a Comet from the Earth, and the elements of its orbit. By J. W. Lubbock.
- De Trilobitis. Auc. H. F. Emmrich. Berolini, 1839.
- Observata Quædam Anatomica de Auchenia Lama. Auc. J. O. L. Möller, Regimontii Prussorum, 1840.
- Verszeichnisse der in Pommern vorkommenden Vogel. Herausg. Harnschuch und Schilling. Greifswald, 1837.

October 7th.

- Proceedings of the Boston Society of Natural History, vol. v. pp. 388—400. From the Society.
- Ninth Annual Report of the Regents of the University of the State of New York. From the Regents.
- The Canadian Journal, Sept., 1856. From the Editors.
- The Canadian Naturalist and Geologist, Sept., 1856. From the Editor.
- Statistics of the Flora of the Northern United States. By Asa Gray. From the Author.
- Experiments upon Digestion. By F. G. Smith, M. D., &c. From the Author.
- The New Orleans Medical and Surgical Journal, Sept., 1856. From the Editor.
- The Quarterly Journal of the Geological Society, vol. xii. pt. 3, No. 47. From the Society.
- Recueil des Actes de l'Académie Impériale de Bordeaux. 1855, 3e et 4e trimestre. From the Academy.
- On two new Genera of Fungi. By the Rev. M. J. Berkeley. From the Author.
- Dr. Wyman on Podisoma Macropus, with remarks by M. J. Berkeley. From the same.
- On the Amber Beds of East Prussia. By Dr. K. Thomas. From the same.
- Observations on the Sphariacem. By Prof. Guiseppe de Notaris. From the same.
- On the probable conversion of Asci into Spores. By M. J. Berkeley and C. E. Broome. From the same.

- On the White Rust of Cabbages. By M. J. Berkeley. From the same.
 Notice of a Mould attacking the Coffee Plantations in Ceylon. By M. J. Berkeley. From the same.
 A Micrographic Study of the Disease of Saffron, known under the name of Tacon. By C. Montague, M. D. From the same.
 Enumeration of some Fungi from St. Domingo. By M. J. Berkeley. From the same.
 On a form of Scab in Potatoes. By M. J. Berkeley. From the same.
 Dr. Schleiden's Theory of Agriculture. By M. J. Berkeley. From the same.
 On a Peculiar form of Mildew in Onions. By M. J. Berkeley. From the same.
 Observations on a form of White Rust in Pear Trees. By M. J. Berkeley. From the same.
 Botanical Notes on the Mildew of the Vine and Hop. By M. J. Berkeley. From the same.
 On the Vine Mildew. By Hugo Mohl. From the same.
 Observations on the Dentalium Subulatum of Deshayes. By M. J. Berkeley. From the same.
 On the Internal Structure of Helicoinax. By M. J. Berkeley.
 Some Notes upon Cryptogamia and Fungi. By Dr. F. Welwitsch and J. M. Berkeley. From the same.
 On the Bleached Wood of the Arctic Voyagers as a possible indication of the route of Capt. Sir J. Franklin. By M. J. Berkeley. From the same.
 Centuries of North American Fungi. By M. J. Berkeley and M. A. Curtis. From the same.
 On Moulds allied to Fumago. By M. J. Berkeley and J. B. H. J. Desmasières. From the same.
 Researches on the Structure of Annular vessels. By Hugo Mohl. Preliminary Reply to Mohl's Essay by Dr. M. J. Schleiden. From the same.
 Smithsonian Contributions to Knowledge, vol. viii. From the Smithsonian Institution.
 The following were presented by Dr. T. B. Wilson, on the usual condition :—
 The London Athenæum, August, 1856.
 Bulletin de la Société Impériale Zoologique D'Acclimatation. T. iii. No. 8.
 Comptes Rendus, T. xliii. Nos. 6, 7, 8.
 The Annals and Magazine of Natural History. Vol. xviii. Nos. 104, 105.
 The London, Edinburgh and Dublin Philosophical Magazine, 4th series, vol. xii. Nos. 77, 78.
 Conchologia Iconica. Part 157.
 L'Organisation du Règne Animal. Par G. M. Blanchard. 18e liv. Arachnides, liv. 9e.
 The Ferns of Great Britain and Ireland. By Thos. Moore and Jas. Lindley. Part. xvii.
 Malakozoologische Blätter. Band. iii. Bogen 4-6.
 A Manual of Marine Zoology for the British Isles. By P. H. Gosse, F. R. S. Part ii. London, 1856.
 Ferny Combes; A Ramble after Ferns in the Glens and Valleys of Devonshire. By Charlotte Chanter. London, 1856.
 A Dictionary of Botanical Ferns. By Rev. J. S. Henslow, M. A. London.
 On the Variation of species with especial reference to the Insecta; followed by an Inquiry into the Nature of Genera. By V. V. Wollaston, M. A., &c. London, 1856.
 Report of the twenty-fifth Meeting of the British Association for the Advancement of Science. London, 1856.

October 14th.

- The following were presented by Mr. Edward Wilson :—
 De Hepate Molluscorum. Auc. J. Frank. Berolini, 1844.
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